SEP 2 1981

Wollensak

WOLLENSAK OPTICAL COMPANY
850 HUDSON AVENUE · ROCHESTER 21, NEW YORK

September 19, 1960

Engineering Associates
434 Patterson Road
Dayton 19, Ohio

Attention: Mr. Charles C. Littell, Jr.

Dear Mr. Littell:

With reference to your recent inquiry, we do have available the Electronic Counters Inc., Model M-3106A Generator. This unit is known as our catalog #WF-311 and sells at $550.00, F.O.B., Rochester, New York.

We are enclosing our general Fastax Catalog which describes this unit. We regret that we do not have this instruction manual available to also enclose. If you require this, we will be in a position to forward one in the not to distant future.

With reference to the Model 2098B, 1000 Cycle Generator, this unit was discontinued almost 10 years ago and are sorry that we do not have a manual or technical information available.

After you have had an opportunity to review the above and the enclosed literature, should you desire further information, please feel free to contact us again.

Very truly yours,

WOLLENSAK OPTICAL COMPANY

RICHARD R. YOUSO

RRY/me

Enc:

WF1 · 8mm Fastax Camera | 100′ capacity

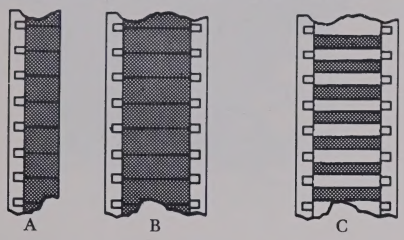
TECHNICAL SPECIFICATIONS

Film Capacity—100′ daylight loading spool.

Film—16mm with 8mm perforations.

Frame Size—

8mm, single width (A) or 8mm, double width (B) — With Interchangeable Slit Aperture Approx. ½ Full Frame. (C)



Standard Aperture—
Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).

Slit Apertures (C)
*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—300 to 16,000 P.P.S. (pictures per second).

Shutter—8 sided High Index Glass Rotating Prism.

Effective Shutter Speed (SS)
With Standard, A or B 8mm Aperture

$$SS = \frac{1}{3 \times pps}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{50 \times pps}$$

i.e.: At 16,000 pps with Standard A or B Aperture

$$SS = \frac{1}{48{,}000} \text{ of a second}$$

At 16,000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

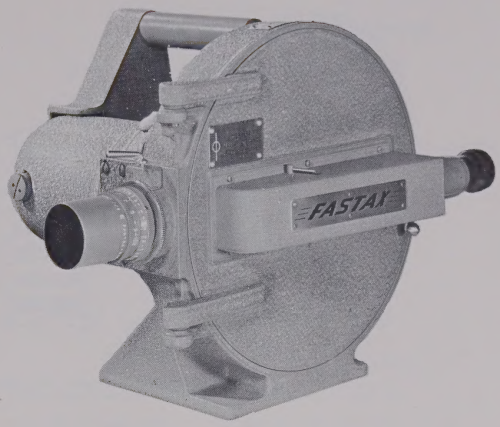
Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.* Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*



Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—
Minimum— 8 volts DC, 2.3 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 30 volts AC, 3.0 amps. approx.
Maximum—280 volts AC, 11 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.
Camera Weight—25 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

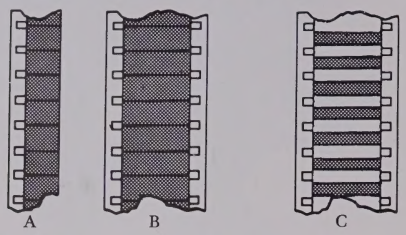
PRINTED IN U.S.A.

WF2 · 8mm Fastax Camera | 400′ capacity

TECHNICAL SPECIFICATIONS

Film Capacity—400′ daylight loading spool.

Film—16mm with 8mm perforations.



Frame Size—

8mm, single width (A) or 8mm, double width (B)

With Interchangeable Slit Aperture Approx. ½ Full Frame. (C)

Standard Aperture—	*Slit Apertures (C)*
Interchangeable masks	*0.040″ x 0.410″ Slit
furnished with each	*0.030″ x 0.410″ Slit
camera, one for 8mm,	*0.020″ x 0.410″ Slit
single width (A) and	*0.010″ x 0.410″ Slit
one for 8mm, double	*0.005″ x 0.410″ Slit
width (B).	*0.003″ x 0.410″ Slit

Speed—700 to 18,000 P.P.S. (pictures per second).

Shutter—8 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard A or B 8mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{50 \text{ x pps}}$$

i.e.: At 18,000 pps with Standard A or B Aperture

$$SS = \frac{1}{54{,}000} \text{ of a second}$$

At 18,000 pps with 0.003″ Slit in place

$$SS = \frac{1}{900{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

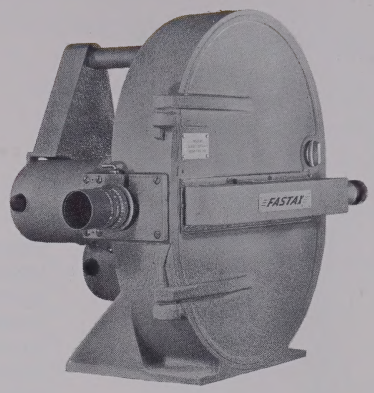
Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*



Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 12 volts DC, 2.4 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 35 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

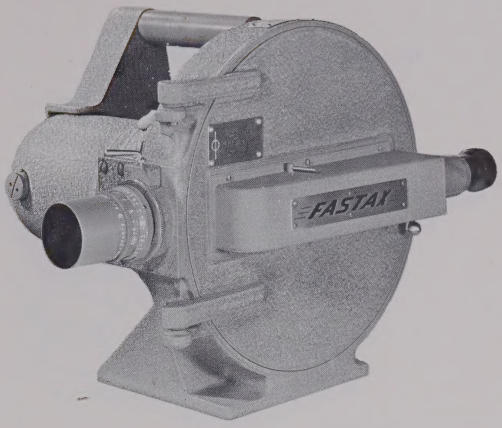
PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 20″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
400′ film-spool can.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.

WF3 · 16mm Fastax Camera | 100′ capacity



TECHNICAL SPECIFICATIONS

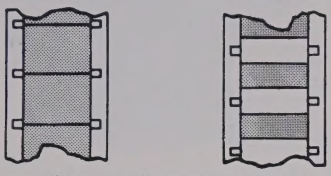
Film Capacity—100′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—150 to 8000 P.P.S (pictures per second).

Shutter—4 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 8000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.* Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 8 volts DC, 2.3 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 30 volts AC, 3.0 amps approx.
Maximum—280 volts AC, 11 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 16″ x 16″.

Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

PRINTED IN U.S.A.

WF4 • 16mm Fastax Camera | 400′ capacity

TECHNICAL SPECIFICATIONS

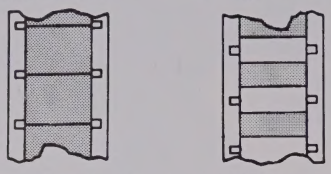
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—350 to 9000 P.P.S. (pictures per second).

Shutter—4 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 9000 pps with Standard Aperture

$$SS = \frac{1}{27{,}000} \text{ of a second}$$

At 9000 pps with 0.003″ Slit in place

$$SS = \frac{1}{900{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

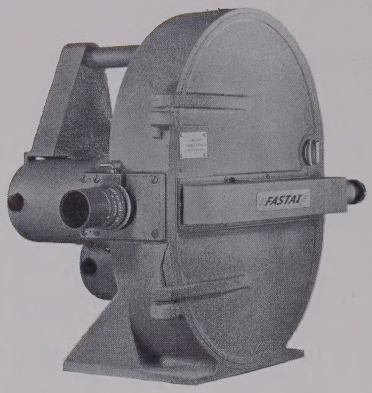
Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*



Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 12 volts DC, 2.4 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 35 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.

Camera Weight—38 lbs.

Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—15″ x 19″ x 20″.

Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Spool, for daylight loading. (5)
Instruction Book.
Two dust caps.
Lubricant atomizer.
400′ film-spool can.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.

WF3T · 16mm Fastax Camera | 100′ capacity

TECHNICAL SPECIFICATIONS

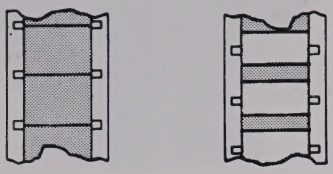
Film Capacity—100′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—150 to 6000 P.P.S. (pictures per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{5 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 6000 pps with Standard Aperture

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

$$SS = \frac{1}{600{,}000} \text{ of a second}$$

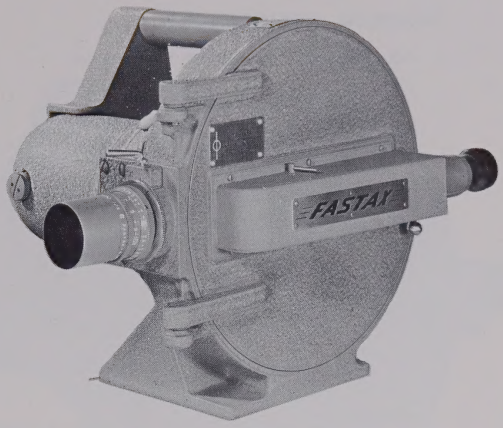
Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*
Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*



Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 9 volts DC, 2.4 amps. approx.
Maximum— 30 volts DC, 3† amps. approx.
Minimum— 25 volts AC, 2.5 amps. approx.
Maximum—200 volts AC, 10 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.
Camera Weight—25 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

PRINTED IN U.S.A.

WF4T · 16mm Fastax Camera | 400′ capacity

TECHNICAL SPECIFICATIONS

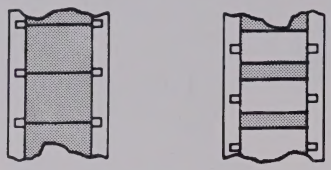
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—350 to 6000 P.P.S. (pictures per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{5 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 6000 pps with Standard Aperture

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

$$SS = \frac{1}{600{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

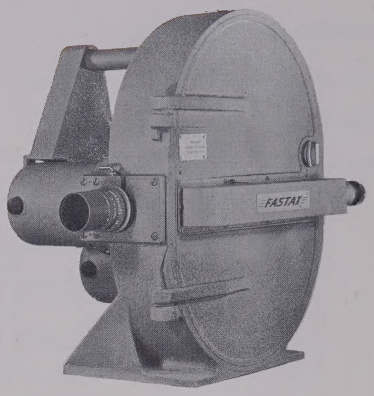
Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

* *Available as an accessory.*



Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 12 volts DC, 2.4 amps. approx.
Maximum— 27 volts DC, 4† amps. approx.
Minimum— 35 volts AC, 4 amps. approx.
Maximum—200 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—15″ x 19″ x 20″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
400′ film-spool can.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.

WF5 · 35mm Fastax Camera | 100′ capacity

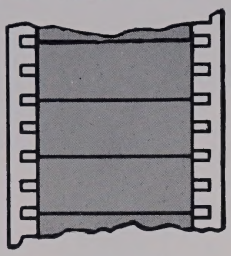
Half Frame

TECHNICAL SPECIFICATIONS

Film Capacity—100′ daylight loading spool.

Film—35mm, Standard positive perforation and pitch recommended.

Frame Size—35mm, half frame.



Aperture—35mm, half frame.

Speed—100 to 6000 P.P.S. (pictures per second).

Shutter—4 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)
With Standard 35mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

Lens—1⅜″ (35mm) *f*/2.0 Fastax Raptar in focusing mount, with double focusing scale. Scale in color "Red" is used for focusing when using the Removable Reflex Finder behind the lens.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder and Removable Reflex Finder are furnished with the camera.

1. Integral Viewfinder. It is primarily used for critical focusing through the camera aperture.
2. The Removable Reflex Finder, Type I. Used between the camera and taking lens for full area composition and for focusing by using the double focusing scale on the lens.

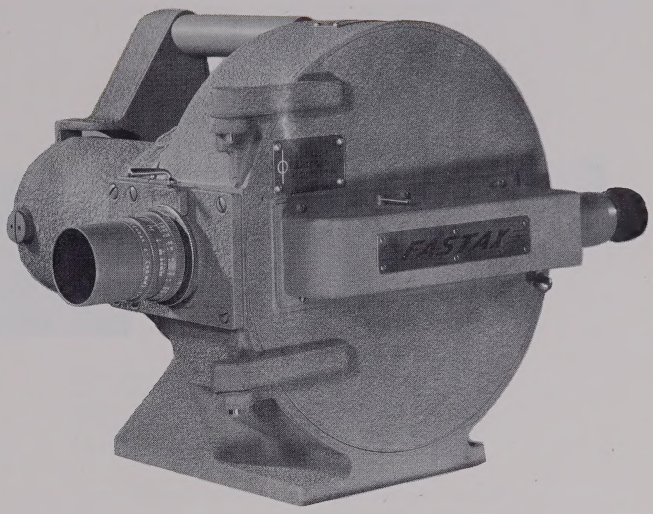
Timing Light—Single timing light—120 "pips," or "marks," per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.*
Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cutoff Switch—Automatically cuts off camera at end of the film run.

Power Requirements, Recommended—
Minimum— 8 volts DC, 2.3 amps. approx.
Maximum— 30 volts DC, 3 † amps. approx.
Minimum— 30 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 13.5 amps. approx.
†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive and one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.



PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 13½″.
Camera Weight—29 lbs.
Shipping Weight—Approximately 50 lbs in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

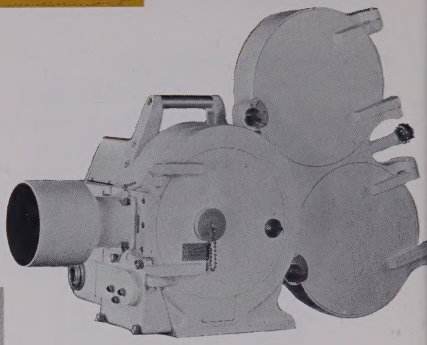
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-362.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

* *Available as an accessory.*

PRINTED IN U.S.A.

WF8A · 35mm Fastax Camera | 400′ capacity

Full Frame

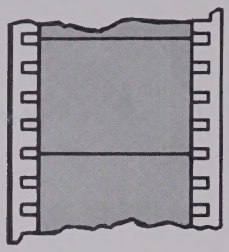


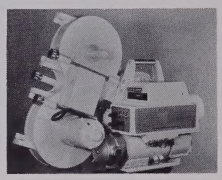
TECHNICAL SPECIFICATIONS

Film Capacity—400′ daylight loading spool.

Film—35mm, Standard positive perforation and pitch recommended.

Frame Size—35mm, full frame.





Aperture—35mm, full frame.

Speed—200-2000 pictures per second in 8 speeds without motor exchange. Push button selected - Low range 200, 400, 600, 800 P.P.S. - High range 500, 1000, 1500, 2000 P.P.S. Operating speed is maintained within ±4% of the pre-set value without external control accessories.

Shutter—4 sided High Index Glass Rotating Prism with Rotating Drum.

Effective Shutter Speed—(SS)
With Standard 35mm Aperture

$$SS = \frac{1}{4 \times pps}$$

Lens—5⅜″ (135mm) *f*/3.5 Fastax Pro-Raptar in focusing mount.

Lens Mount—FX2 Fastax Bayonet
The objective lens mount can be raised or lowered allowing greater flexibility of field coverage when the camera is used for metric data purposes.

Magazines—One external magazine furnished—Loads with 400′ daylight loading spools.

Viewfinder—
1. Removable finder for composition and focusing. Furnished with the camera.
*2. Removable Reflex Finder Type IV. Used between the objective lens and the camera for critical composition and metric alinement.

Timing Light—Supplied with double timing light installed as standard equipment:
1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Stop-start Characteristic—Camera can be stopped at the 200 p.p.s. speed setting permitting multiple runs throughout the 400 foot roll.

Cut-off Switch—Automatically cuts off camera at the end of the film run.

Fiducial Marker—(3) Optically produced within the frame area. On/Off and intensity control provided.

Power Requirements—115-125 VAC, 60 cycle, single phase, 200-1000 P.P.S. 30 amp. line required. †155-175 VAC 60 cycle, single phase, 1500-2000 P.P.S. 60 amp. line required.

†Use 220 V AC 60 cycle single phase input to WF-365 Transformer.

Motors—Two. One for drive, one for take-up. Cover complete speed range.

Tripod and Tie-down Socket—Thread size, ⅜″ x 16 N.C. (5 provided).

PHYSICAL CHARACTERISTICS

Size—22″ x 25″ x 12½″ with magazine.
Camera Weight—with motor - 87 lbs.
Magazine Weight—with motor - 23 lbs.
Shipping Weight—Approximately 178 lbs. - in tw (2) carrying cases, packed for domestic shipmen
Camera Color—White.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Two (2) fiber carrying cases - one (1) for camera one (1) for magazine and accessories.
Camera test film.
Instruction Book.
Power cord.
Two (2) Amphenol connectors. (Timing Light an Remote Control).
Spools for daylight loading (5).
Camera focusing film kit, WF-361.
Large dust cap.
Film spool gauge.
"V" cut film trimmer.
Camera dust cover.
Magazine dust cover.
†Transformer (WF-365)
Warranty card.

** Available as an accessory.*

WF6 • 16mm Fastax Camera | 100′ capacity

Oscillographic

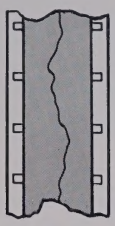
TECHNICAL SPECIFICATIONS

Oscillographic—Similar in design to the WF3 camera except rotating prism is not supplied.

Film Capacity—100′ daylight loading spool.

Film—16mm.

Frame Size—None. Continuous recording of streak or oscillographic image.



Aperture—

16mm Full Frame or	*0.040″ x 0.410″ Slit
	*0.030″ x 0.410″ Slit
	*0.020″ x 0.410″ Slit
	*0.010″ x 0.410″ Slit
	*0.005″ x 0.410″ Slit
	*0.003″ x 0.410″ Slit

Speed—(Recording) 4 feet to 200 feet per second.

Shutter—None.

$$\text{Total exposure Time (Te)} = \frac{\text{slit width in inches}}{\text{film velocity in inches}}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full image area for composition.

Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF-311 Timing Light Generator.*

Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

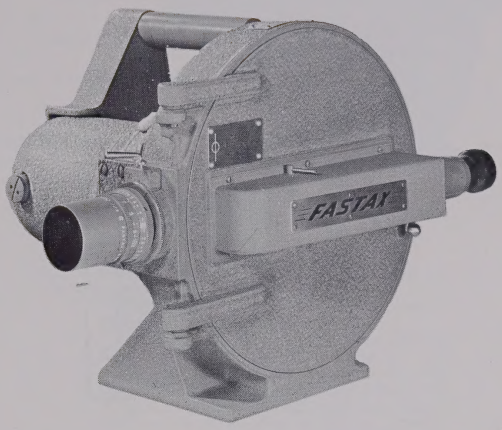
Cut-off Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 8 volts DC, 2.3 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 30 volts AC, 3.0 amps approx.
Maximum—280 volts AC, 11 amps. approx.

†*DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.*

* *Available as an accessory.*



Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.
Camera Weight—25 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

PRINTED IN U.S.A.

WF7 · 35mm Fastax Camera | 100′ capacity

Oscillographic

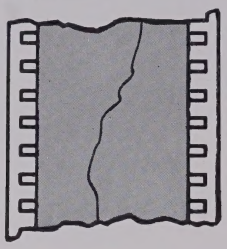
TECHNICAL SPECIFICATIONS

Oscillographic—Similar in design to the WF5 camera except rotating prism is not supplied.

Film Capacity—100′ daylight loading spool.

Film—35mm standard positive perforation and pitch recommended.

Frame Size—None. Continuous recording of streak or oscillographic image.



Aperture—

35mm half frame or **.040″ x 0.868″ Slit
**.030″ x 0.868″ Slit
**.020″ x 0.868″ Slit
**.010″ x 0.868″ Slit

Speed—(Recording) 3 feet to 190 feet per second.

Shutter—None.

$$\text{Total exposure Time (Te)} = \frac{\text{slit width in inches}}{\text{film velocity in inches}}$$

Lens—1⅜″ (35mm) *f*/2.0 Fastax Raptar in focusing mount, with double focusing scale. Scale in color "Red" is used for focusing when using the Removable Reflex Finder behind the lens.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder and Removable Reflex Finder are furnished with the camera.

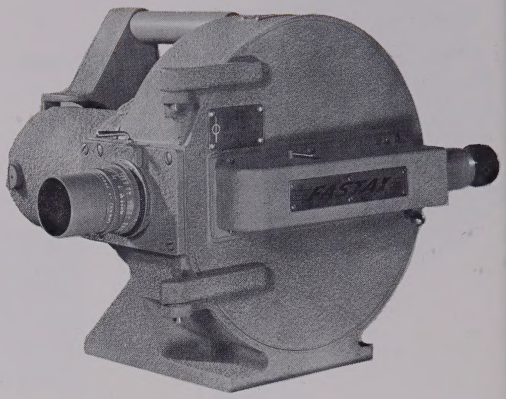
1. Integral Viewfinder. It is primarily used for critical focusing through the camera aperture.
2. The Removable Reflex Finder, Type I. Used between the camera and taking lens for full area composition and for focusing by using the double focusing scale on the lens.

Timing Light—Single timing light—120 "pips," or "marks," per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.*

Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

**Available as an accessory.*
***35mm half frame slit aperture housing and slit masks available on special order.*



Power Requirements, Recommended—

Minimum— 8 volts DC, 2.3 amps. approx.
Maximum— 30 volts DC, 3† amps. approx.
Minimum— 30 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 13.5 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive and one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

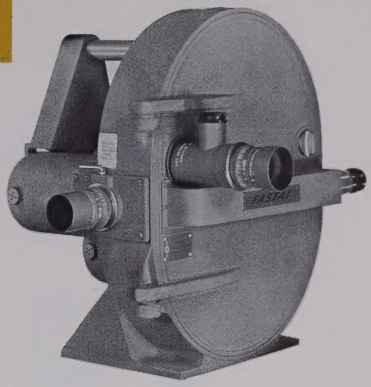
Size—12″ x 12″ x 13½″.
Camera Weight—29 lbs.
Shipping Weight—Approximately 50 lbs in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-362.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

WF14 • 16mm Fastax Camera | 400′ capacity

Combined Motion-Picture and Oscillographic Superimposed



TECHNICAL SPECIFICATIONS

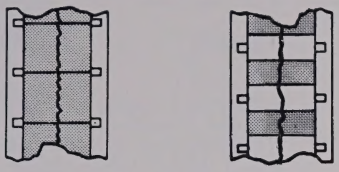
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—650 to 8000 P.P.S. (16 ft. per second to 200 ft. per second).

Effective Shutter Speed—(SS)

With Standard 16mm

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture in place

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 8000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera:

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 16 volts DC, 2.5 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 35 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 19″ x 20″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

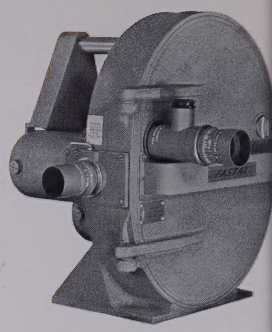
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
400′ film-spool can.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.

PRINTED IN U.S.A.

* *Available as an accessory.*

WF15 · 8mm Fastax Camera | 400′ capacity

Combined Motion-Picture and Oscillographic Superimposed



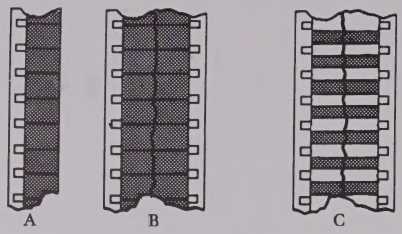
TECHNICAL SPECIFICATIONS

Film Capacity—400′ daylight loading spool.

Film—16mm with 8mm perforations.

Frame Size—

8mm, single width (A) or 8mm, double width (B) — With Interchangeable Slit Aperture Approx. ½ Full Frame. (C)



Standard Aperture—
Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).

Slit Apertures (C)
*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—1300 to 16,000 P.P.S. (16 ft. per second to 200 ft. per second).

Shutter—8 sided High Index Glass Rotating Prism.

Effective Shutter Speed (SS)
With Standard, A or B 8mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{50 \text{ x pps}}$$

i.e.: At 16,000 pps with Standard A or B Aperture

$$SS = \frac{1}{48{,}000} \text{ of a second}$$

At 16,000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.

Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—
Minimum— 16 volts DC, 2.5 amps. approx.
Maximum— 28 volts DC, 3† amps. approx.
Minimum— 35 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up. Covers complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 19″ x 20″.
Camera Color—Fastax Gray.

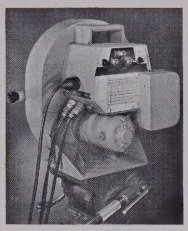
ADDITIONAL ITEMS FURNISHED WITH CAMERA

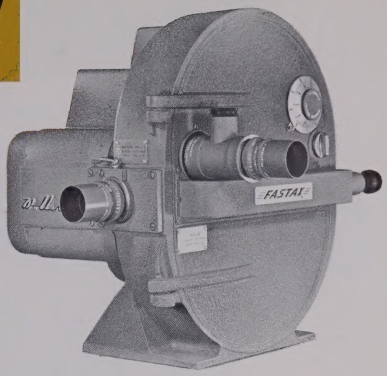
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
400′ film-spool can.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.

* *Available as an accessory*

WF14S · 16mm Fastax Camera | 400′ capacity

Combined Motion-Picture and Oscillographic Superimposed





TECHNICAL SPECIFICATIONS

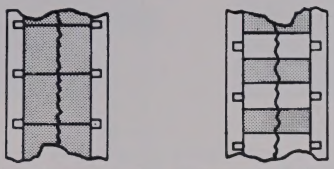
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—350 to 8400 P.P.S. (pictures per second).

Shutter—4 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 9000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.

Timing Light—Supplied with double timing light installed as standard equipment:

Stop-start Characteristic—Camera can be rapidly stopped at any point permitting multiple runs throughout 400 foot roll. Operable at any frame rate. Dynamic braking on drive motor — prism shaft assembly. Synchronized magnetic braking on feed spindle and take up motor.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 16 volts DC, 2.4 amps. approx.
Maximum— 28 volts DC, 3 amps. approx.
Minimum— 45 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

Connections—

Camera Power Input: 110V AC-DC Amphenol connector.
Braking Circuit Input: 2 prong Hubbell Twist Lock connector.
Remote Control: Amphenol connector.
Double Timing Light: Amphenol connector.

Switches—

Camera Power "On-off".
Stop Start.
Speed Range Selector Switch.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″
Camera Weight—60 lbs.
Shipping Weight—Approximately 85 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 21″ x 22″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film spool gage.
3 Amphenol connectors.

* *Available as an accessory.*

PRINTED IN U.S.A.

WF14ST • 16mm Fastax Camera | 400′ capacity

Combined Motion-Picture and Oscillographic Superimposed

TECHNICAL SPECIFICATIONS

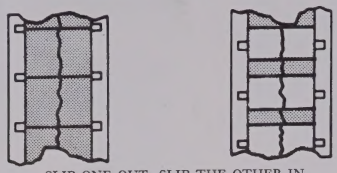
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—350 to 6000 P.P.S. (pictures per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{5 \times pps}$$

With 0,003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \times pps}$$

i.e.: At 6000 pps with Standard Aperture

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

$$SS = \frac{1}{600{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

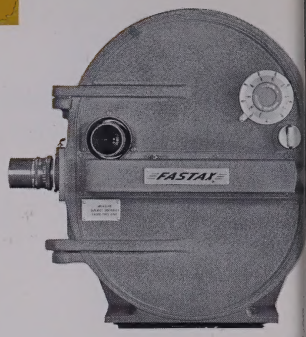
1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.

Timing Light—Supplied with double timing light installed as standard equipment:

Stop-start Characteristic—Camera can be rapidly stopped at any point permitting multiple runs throughout 400 foot roll. Operable at any frame rate. Dynamic braking on drive motor — prism shaft assembly. Synchronized magnetic braking on feed spindle and take up motor.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

* *Available as an accessory.*



Power Requirements, Recommended—

Minimum— 20 volts DC, 2.5 amps. approx.
Maximum— 30 volts DC, 3 amps. approx.
Minimum— 60 volts AC, 3.5 amps. approx.
Maximum—200 volts AC, 12 amps. approx.

Connections—

Camera Power Input: 110V AC-DC Amphenol connector.
Braking Circuit Input: 2 prong Hubbell Twist Lock connector.
Remote Control: Amphenol connector.
Double Timing Light: Amphenol connector.

Switches—

Camera Power "On-off".
Stop Start.
Speed Range Selector Switch.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″
Camera Weight—60 lbs.
Shipping Weight—Approximately 85 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 21″ x 22″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film spool gage.
3 Amphenol connectors.

WF17 • 16mm Fastax Camera | 100′ capacity

Combined Motion-Picture and Oscillographic Superimposed

TECHNICAL SPECIFICATIONS

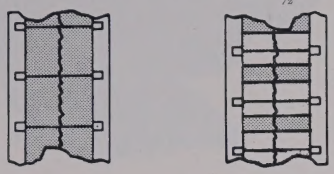
Film Capacity—100 daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

0.040″ x 0.410″ Slit
0.030″ x 0.410″ Slit
0.020″ x 0.410″ Slit
0.010″ x 0.410″ Slit
0.005″ x 0.410″ Slit
0.003″ x 0.410″ Slit

Speed—150 to 8000 P.P.S. (5 ft. per second to 200 ft. per second).

Effective Shutter Speed—(SS)

With Standard 16mm

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture in place

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 8000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

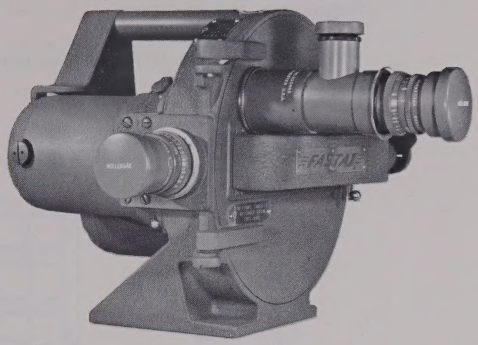
Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

The 50mm lens is used with the Removable Reflex Finder, Type III, for composition and focusing of the Oscillographic trace. After focusing, remove the Reflex Finder and replace it with the lens, transferring the reading obtained on the yellow scale to the white scale. If other focal length lenses are used, it is necessary that the distances be measured and the focusing mount set accordingly.

Lens Mount—FX1 Fastax Bayonet Mount.

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*2.0 lens and the camera to compose and focus the oscillographic trace.



Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*

Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—
Minimum—8 volts DC, 2.3 amps. approx.
Maximum—28 volts DC, 3.0 amps. approx.
Minimum—30 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

Motors—Two motors (115 volts, AC-DC, 50/60 cycle). One for drive, one for take-up.

Tripod Socket—Thread Size, ⅜″ x 16NC.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 16″ x 16″.

Camera Color—Fastax Gray

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

Existing WF3 cameras may be modified to the WF17.

*Available as an accessory.

PRINTED IN U.S.A.

WF17T • 16mm Fastax Camera | 100′ capacity

Combined Motion-Picture and Oscillographic Superimposed

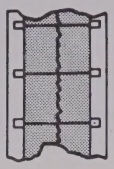
TECHNICAL SPECIFICATIONS

Film Capacity—100′ daylight loading spool.

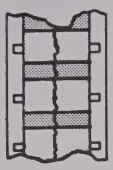
Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.



With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or	*0.040″ x 0.410″ Slit
	*0.030″ x 0.410″ Slit
	*0.020″ x 0.410″ Slit
	*0.010″ x 0.410″ Slit
	*0.005″ x 0.410″ Slit
	*0.003″ x 0.410″ Slit

Speed—150 to 6000 P.P.S. (5 ft. per second to 150 ft. per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{5 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 6000 pps with Standard Aperture

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

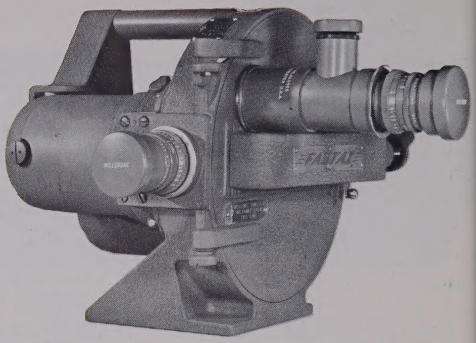
$$SS = \frac{1}{600{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.



Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.* Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 9 volts DC, 2.4 amps. approx.
Maximum— 30 volts DC, 3† amps. approx.
Minimum— 25 volts AC, 2.5 amps. approx.
Maximum—200 volts AC, 10 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up. Covers complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 16″ x 16″.

Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

* *Available as an accessory.*

WF17 · 16mm Fastax Camera | 100′ capacity

Combined Motion-Picture and Oscillographic Superimposed

TECHNICAL SPECIFICATIONS

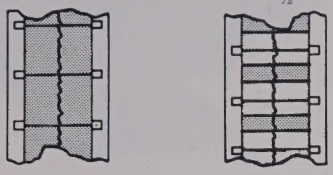
Film Capacity—100 daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. [redacted] Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or	0.040″ x 0.410″ Slit
	0.030″ x 0.410″ Slit
	0.020″ x 0.410″ Slit
	0.010″ x 0.410″ Slit
	0.005″ x 0.410″ Slit
	0.003″ x 0.410″ Slit

Speed—150 to 8000 P.P.S. (5 ft. per second to 200 ft. per second).

Effective Shutter Speed—(SS)

With Standard 16mm

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture in place

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 8000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

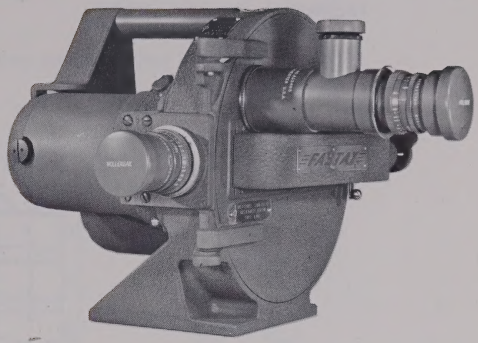
Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

The 50mm lens is used with the Removable Reflex Finder, Type III, for composition and focusing of the Oscillographic trace. After focusing, remove the Reflex Finder and replace it with the lens, transferring the reading obtained on the yellow scale to the white scale. If other focal length lenses are used, it is necessary that the distances be measured and the focusing mount set accordingly.

Lens Mount—FX1 Fastax Bayonet Mount.

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*2.0 lens and the camera to compose and focus the oscillographic trace.



Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*

Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—
Minimum—8 volts DC, 2.3 amps. approx.
Maximum—28 volts DC, 3.0 amps. approx.
Minimum—30 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

Motors—Two motors (115 volts, AC-DC, 50/60 cycle). One for drive, one for take-up.

Tripod Socket—Thread Size, ⅜″ x 16NC.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 16″ x 16″.

Camera Color—Fastax Gray

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

Existing WF3 cameras may be modified to the WF17.

**Available as an accessory.*

PRINTED IN U.S.A.

WF17T • 16mm Fastax Camera | 100′ capacity

Combined Motion-Picture and Oscillographic Superimposed

TECHNICAL SPECIFICATIONS

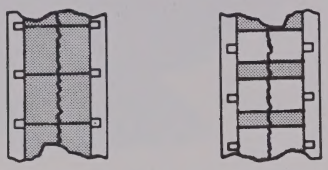
Film Capacity—100′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—150 to 6000 P.P.S. (5 ft. per second to 150 ft. per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{5 \times pps}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \times pps}$$

i.e.: At 6000 pps with Standard Aperture

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

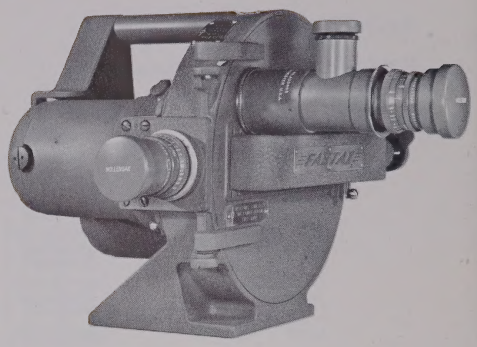
$$SS = \frac{1}{600{,}000} \text{ of a second}$$

Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.



Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*
Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum— 9 volts DC, 2.4 amps. approx.
Maximum— 30 volts DC, 3† amps. approx.
Minimum— 25 volts AC, 2.5 amps. approx.
Maximum—200 volts AC, 10 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up. Covers complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 16″ x 16″.

Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

* *Available as an accessory.*

stax Raptar Lenses

for use with 8 and 16mm Fastax Cameras. (Cont.)

Focal Length Inches	MM	Speed	Mounting	Filter Size	Focus Range	Diaphragm Range	Click Stop	Horizontal Coverage
3	75	f/2.5	Focusing Mt.	No. 7**	5′ to inf.	f/2.5 to f/22	Yes	7.6°
3	75	f/2.5	" "	No. 7**	5′ to inf.	f/2.5 to f/22	Yes	7.6°
3	75	f/2.5	" "	No. 7**	5′ to inf.	f/2.5 to f/22	Yes	7.6°
4	101	f/3.5	" "	No. 7**	8′ to inf.	f/3.5 to f/22	Yes	5.7°
4	101	f/3.5	" "	No. 7**	8′ to inf.	f/3.5 to f/22	Yes	5.7°
4	101	f/3.5	" "	No. 7**	8′ to inf.	f/3.5 to f/22	Yes	5.7°
6	152	f/4.5	" "	No. 7**	20′ to inf.	f/4.5 to f/32	Yes	3.8°
10	254	f/4.5	" "	No. 8	50′ to inf.	f/4.5 to f/22	Yes	2.3°
15	381	f/5.6	Barfel "	3″	418′ to inf.	f/5.6 to f/32	Yes	1.5°

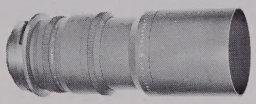
white scale for use with 35mm Half Frame Fastax Cameras incorporating Type I or Type II Reflex Viewfinder.
nd white focusing scale used with 8 and 16mm Fastax Combined Motion Picture and Oscillographic Cameras incorporating Type III Reflex Viewfinder.
ing Size VII.
Ring Size VI.
le.
lenses in focusing mount available with scales marked in meters when specified.

stax Pro-Raptar Lenses

for use with 35mm Full Frame Fastax Cameras.

Wide Angle

Normal



Telephoto

Focal Length Inches	MM	Speed	Mounting	Filter Size	Focus Range	Diaphragm Range	Click Stop	Horizontal Coverage
2	50	f/2.8	Focusing Mt.	No. 8	2′ to inf.	f/2.8 to f/22	Yes	28.1°
3	75	f/2.8	Fixed	No. 8	None	f/2.8 to f/16	Yes	18.9°
4	101	f/2.3	Focusing Mt.	No. 7	4′ to inf.	f/2.3 to f/22	Yes	14.2°
5⅜	135	f/3.5	" "	No. 7	6′ to inf.	f/3.5 to f/22	Yes	10.16°
6	152	f/2.7	" "	No. 8	8′ to inf.	f/2.7 to f/22	Yes	9.5°
10	254	f/4.5	" "	No. 8	50′ to inf.	f/4.5 to f/22	Yes	5.41°
15	381	f/4.5	" "	4¼″	35′ to inf.	f/4.5 to f/32	Yes	3.61°

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Wollensak Fastax Lenses

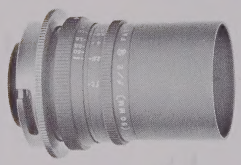
Wollensak Fastax Raptar Lenses are designed to meet the highest standards of performance. Each lens has high resolution without the sacrifice of contrast. It is color corrected and provides full coverage to the edge of the film. The exact focal length of each lens is precisely measured and is engraved on the lens mount.

A series of Fastax Lenses in focal lengths from 3.7mm (extreme wide angle) to the 200″ Mirrotel and extension tubes are available to meet each high-speed requirement. Each Fastax Camera is supplied complete with the standard focal length lens listed. A set of those lenses most often used, in addition to the one furnished on the camera, together with a set of extension tubes is available in kit form at a considerable saving over unit cost.

Fastax Raptar Lenses

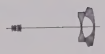
for use with 8 and 16mm Fastax Cameras.

Wide Angle



Normal

Telephoto

Catalog No.		Focal Length Inches	Focal Length MM	Speed	Mounting	Filter Size	Focus Range	Diaphragm Range	Click Stop	Ho Co
WF-121			3.7	f/1.5	Barrel Mt.		Fixed	f/1.5 to f/16	Yes	1
WF-122		1/5	5.3	f/1.5	″ ″	No. 7	Fixed	f/1.5 to f/16	Yes	
WF-142		1/2	13	f/1.6	″ ″	No. 6	Fixed	f/1.6 to f/16	Yes	
WF-100A		1	25.4	f/2.3	Focusing Mt.	No. 7	12″ to inf.	f/2.5 to f/22	Yes	
WF-102		1 3/8	35	f/2.0	″ ″	No. 7*	1 1/2′ to inf.	f/2.0 to f/22	Yes	
WF-102R		1 3/8	35	f/2.0	″ ″	No. 7*	1 1/2′ to inf.	f/2.0 to f/22	Yes	
WF-102Y		1 3/8	35	f/2.0	″ ″	No. 7*	1 1/2′ to inf.	f/2.0 to f/22	Yes	
WF-105		2	50	f/2.0	″ ″	No. 7**	28″ to inf.	f/2.0 to f/22	Yes	
WF-105R		2	50	f/2.0	″ ″	No. 7**	28″ to inf.	f/2.0 to f/22	Yes	
WF-105Y		2	50	f/2.0	″ ″	No. 7**	28″ to inf.	f/2.0 to f/22	Yes	
WF-106		2	50	f/2.7	″ ″	No. 7**	28″ to inf.	f/2.7 to f/22	Yes	
WF-107		2 1/2	63	f/2.7	″ ″	No. 7**	3 1/2′ to inf.	f/2.7 to f/22	Yes	
WF-107R		2 1/2	63	f/2.7	″ ″	No. 7**	3 1/2′ to inf.	f/2.7 to f/22	Yes	
WF-107Y		2 1/2	63	f/2.7	″ ″	No. 7**	3 1/2′ to inf.	f/2.7 to f/22	Yes	

WF21 • 16mm Fastax Camera | 100′ capacity

Combined Motion-Picture and Oscillographic Superimposed

TECHNICAL SPECIFICATIONS

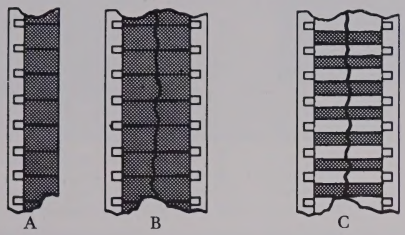
Film Capacity—100′ daylight loading spool.

Film—16mm with 8mm perforations.

Frame Size—

8mm, single width (A) or 8mm, double width (B)

With Interchangeable Slit Aperture Approx. ½ Full Frame. (C)



Standard Aperture—
Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).

Slit Apertures (C)
*0.040″ x 0.410″ Slit
*0.030″ x 0.410″ Slit
*0.020″ x 0.410″ Slit
*0.010″ x 0.410″ Slit
*0.005″ x 0.410″ Slit
*0.003″ x 0.410″ Slit

Speed—300 to 16,000 P.P.S. (pictures per second).

Shutter—8 sided High Index Glass Rotating Prism.

Effective Shutter Speed (SS)
With Standard, A or B 8mm Aperture

$$SS = \frac{1}{3 \times pps}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{50 \times pps}$$

i.e.: At 16,000 pps with Standard A or B Aperture

$$SS = \frac{1}{48{,}000} \text{ of a second}$$

At 16,000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

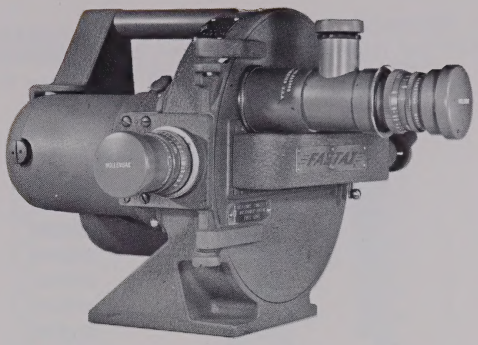
Lenses—Two lenses furnished. One, a 50mm *f*/2.0 Fastax Raptar in focusing mount, is mounted on the front of the camera to record the picture image; the other a 50mm *f*/2.0 Fastax Raptar Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

Lens Mount—FX1 Fastax Bayonet

Viewfinders—Integral Viewfinders and Removable Reflex Finders are furnished with the camera.

1. Integral Viewfinder. For critical focusing and viewing through the camera aperture - covers the full frame for composition.
2. The Removable Reflex Finder, Type III. Used between the 50mm *f*/2.0 lens and the camera to compose and focus the oscillographic trace.

* *Available as an accessory.*



Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*
Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—
Minimum—8 volts DC, 2.3 amps. approx.
Maximum—28 volts DC, 3† amps. approx.
Minimum—30 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Motors—Two motors (115-volt AC-DC 60-cycle).
One for drive, one for take-up. Covers complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.
Camera Weight—25 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film kit, WF-363.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
Two dust caps.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

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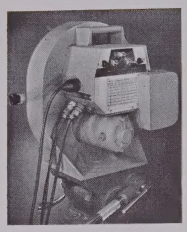
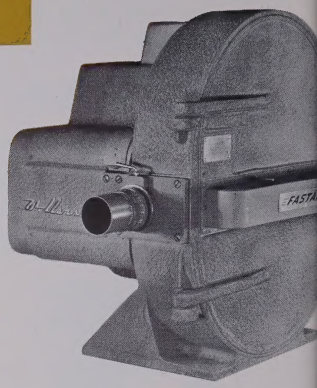
WF2S · 16mm Fastax Camera | 400′ capacity

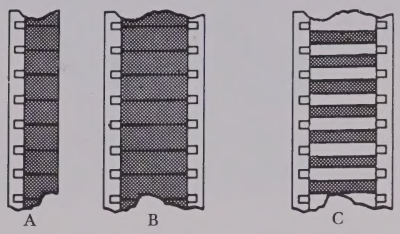




TECHNICAL SPECIFICATIONS

Film Capacity—400′ daylight loading spool.

Film—16mm with 8mm perforations.



Frame Size—
8mm, single width (A) or 8mm, double width (B) — With Interchangeable Slit Aperture Approx. ½ Full Frame. (C)

Standard Aperture—	*Slit Apertures (C)*
Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).	*0.040″ x 0.410″ Slit
	*0.030″ x 0.410″ Slit
	*0.020″ x 0.410″ Slit
	*0.010″ x 0.410″ Slit
	*0.005″ x 0.410″ Slit
	*0.003″ x 0.410″ Slit

Speed—700 to 16,800 P.P.S. (pictures per second).

Shutter—8 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard A or B 8mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{50 \text{ x pps}}$$

i.e.: At 18,000 pps with Standard A or B Aperture

$$SS = \frac{1}{54{,}000} \text{ of a second}$$

At 16,000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2:0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Supplied with double timing light installed as standard equipment:

Stop-start Characteristic—Camera can be rapidly stopped at any point permitting multiple runs throughout 400 foot roll. Operable at any frame rate. Dynamic braking on drive motor — prism shaft assembly. Synchronized magnetic braking on feed spindle and take up motor.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—
Minimum— 16 volts DC, 2.4 amps. approx.
Maximum— 28 volts DC, 3 amps. approx.
Minimum— 45 volts AC, 2.5 amps. approx.
Maximum—280 volts AC, 16 amps. approx.

Connections—
Camera Power Input: 110V AC-DC Amphenol connector.
Braking Circuit Input: 2 prong Hubbell Twist Lock connector.
Remote Control: Amphenol connector.
Double Timing Light: Amphenol connector.

Switches—
Camera Power "On-off".
Stop Start.
Speed Range Selector Switch.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜″ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″
Camera Weight—60 lbs.
Shipping Weight—Approximately 85 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 21″ x 22″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film kit, WF-363
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film spool gage.
3 Amphenol connectors.

* *Available as an accessory.*

Fastax Lens Kit

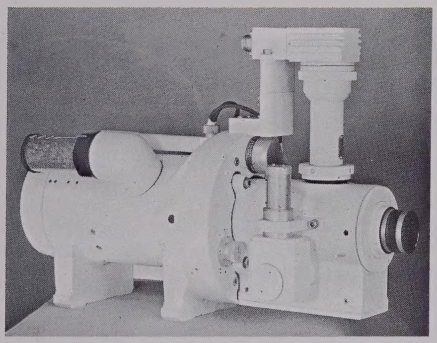
for use with 8 and 16mm Fastax Cameras.

WF-126 Fastax Lens Kit in compartment case consisting of one each of the following:

WF102 35mm *f*/2.0 Raptar
WF110 101mm *f*/3.5 Raptar
WF111 152mm *f*/4.5 Raptar
WF129 ⅜″ Extension Tube
WF130 ⅝″ Extension Tube
WF131 1″ Extension Tube
WF132 2″ Extension Tube

Wollensak Mirrotel Lenses

for use with Fastax and other Photo-Instrumentation Cameras.



Wollensak Catadioptric Optical Systems are used for documentary, surveillance, metric, radar boresighting, and tracking applications on FASTAX and other cameras. Available in 20″, 40″, 80″, and 200″ focal lengths, they offer definite performance advantages over refractive lenses of comparative focal length and aperture as well as a reduction in size and weight.

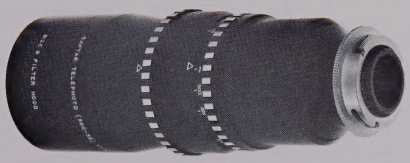
Absence of chromatic aberration, coma, astigmatism and distortion results in excellent resolution (diffraction limited!).

Careful attention to barrel and mounting design and use of aged castings, INVAR spacers, sealing, and desiccants, insure maintenance of Mirrotel high level performance and boresighting accuracy despite subjection to heat, cold, vibration, shock, and pressure change.

For more complete information write for the Wollensak brochure "Mirrotel Catadioptric Optical Systems".

Wollensak Pro-Raptar Lenses

for use with Fastax and other Photo-Instrumentation Cameras.



Wollensak Pro-Raptar Long Focal Length Lenses are available for installation to Fastax and other Photo-Instrumentation Cameras. These fine American-made refractive lens systems are the product of over fifty years of experience in the optical field.

Each Pro-Raptar Lens undergoes rigid inspection throughout its manufacture to assure that the ultimate of performance is maintained as specified by the design.

For complete technical data, accessories, and focal lengths available, refer to the Wollensak catalog "Pro-Raptar Lenses".

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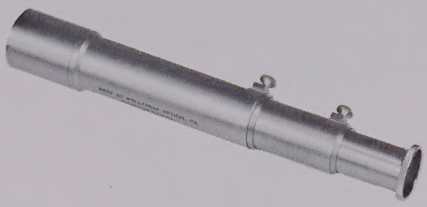
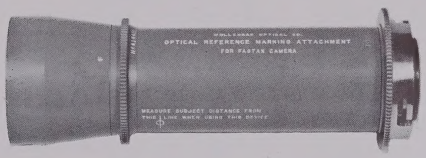
Auxiliary Optical Equipment



WF-135 Microscope Eyepiece, 40 power, for critical focusing through Fastax Camera integral viewfinder. Replaces standard 10 power eyepiece.

Fiducial Marking Attachments

The Fiducial Marking Attachment is an optical system used between the camera and the taking lens. It records simultaneously the subject and reference marks in the form of cross-hairs on each frame. The image from the objective lens is focused on the plano surface of a collective lens on which the reticle cross-hair pattern is engraved. A 1:1 lens system then relays the image and reticle pattern to the film plane. Special reticle patterns are available upon request. These systems are not recommended for use with Fastax Lenses shorter than 1 inch focal length.

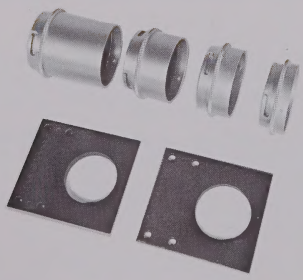


WF-136 Fiducial Marking Attachment for lenses used with all Fastax Cameras except Full Frame 35mm.

WF-209 Fiducial Marking Attachment for lenses used with Full Frame 35mm Fastax Cameras.

Fastax Extension Tubes

for use with all Fastax Cameras except Full Frame 35 mm.



Extension Tubes are used to photograph objects at shorter distances than can be obtained with the lens focusing scale. An image size approaching 1:1 can be obtained. Several tubes may be coupled together permitting maximum flexibility for Macro-Photography. Extension tubes are available for 35mm Fastax Cameras on request.

WF129 Extension Tube ⅜″
WF130 Extension Tube ⅝″
WF131 Extension Tube 1″
WF132 Extension Tube 2″
WF133 Lens Plate Shim ⅛″
WF134 Lens Plate Shim ¼″

WF-301, WF-358 Fastax Power Control Units

Goose Control Unit permits the synchronization of the camera with the event to be photographed, regulation of the camera speed, and remote control of camera and/or event. A four position selector switch controls camera and event start-stop cycle so that camera and event can be started together, or camera started before event by any predetermined time interval or, conversely, event started first with camera start following by any predetermined time interval. Event actuated through a selected open or closed relay. Camera speed controlled by variable AC auto transformer with maximum output of 280 volts. Camera control circuit also incorporates a 70 millisecond delay timer when operating above 130 volts.

WF-301 GOOSE CONTROL UNIT, 115 VOLT AC 60 CYCLE

Specifications:

Voltage Control—0-280 volts AC, 60 cycle.

Power Requirements—115 volts AC, 60 cycle, 30 amperes, with capacity to withstand 100 ampere momentary shock.

Timers—Two plug-in timers supplied, one for camera and one for event. For use with 100 foot capacity Fastax Cameras normally supplied with two 5 second timers—with 400 foot cameras, one 5 second and one 30 second timer. 15 second, 30 second, 60 second, and 5 minute timers available as accessories.

Control—Push-button or remote.

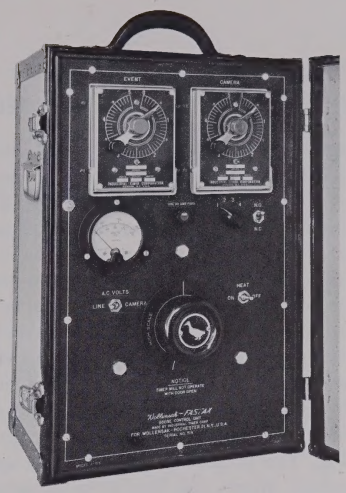
Connectors—Standard AN.

WF-358 GOOSE CONTROL UNIT, 115/220/240 VOLT AC 50 CYCLE

Specifications:

Voltage Control—0-280 volts AC, 50 cycles.

Power Requirements—115/220/240 volts AC, 50 cycle, 30 amperes, with capacity to withstand 100 amperes momentary shock.



Timers—Two plug-in timers supplied, one for camera and one for event. For use with 100 foot capacity Fastax Cameras normally supplied with two 5 second timers—with 400 foot cameras, one 5 second and one 30 second timer. 15 second, 30 second, 60 second and 5 minute timers available as accessories.

Control—Push-button or remote.

Connectors—Standard AN.

PHYSICAL CHARACTERISTICS

Size—10″ x 18″ x 10″.

Weight—60 lbs.

Shipping Weight—Approximately 85 lbs. in carrying case packed for domestic shipment.

Size of Shipping Carton—26″ x 17″ x 15″.

Color—Fastax gray with black control panel.

ADDITIONAL ITEMS FURNISHED

One Power Cord.

One Camera Cord.

One Event Cord.

One Timing Light Cord.

One Remote Control Cord.

One Instruction Book.

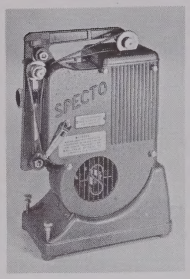
WF-329A, WF-329B Fastax Motion Analysis Projectors

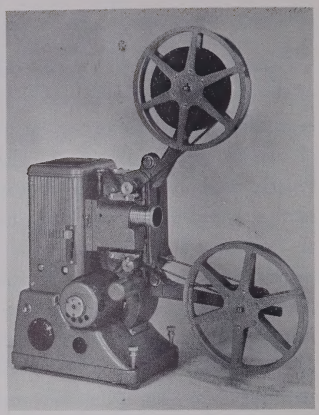
THE MOTION ANALYSIS PROJECTOR

The Wollensak Motion Analysis Projector is designed for the study and analysis of movement of subjects filmed by Fastax 8mm and 16mm high speed motion picture cameras. The films may be projected at the slow motion speed of 2 frames per second without flicker in addition to the normal projection speed of 16 frames per second. A still picture of indefinite duration may also be shown with a small amount of screen illumination loss.

The framing rate is controlled by a single lever which may be moved in either direction or from any one setting to another while the projector is running. The projector incorporates a special feature which allows the film to be advanced frame by frame at the screen. The single frame changing device will shift only one frame at each press of either the fixed or remote button irrespective of the period of pressure applied. Refocusing is not necessary when shifting to or from the hold frame position.

A built-in frame counter enables a single frame or sequence to be identified and correlated with time.





TECHNICAL SPECIFICATIONS

Models—WF-329A - 16mm Half Frame - Pull-down (for 8mm perforated film). WF-329B - 16mm Std. Full Frame Pull-down.

Framing—16pps, 2pps, frame by frame or still picture.

Body—Aluminum alloy casting.

Gears—All machine cut.

Motor—Universal 110 volt AC-DC. Electrically governed.

Gate—Film guide and pressure plate mirror polished stainless steel.

Sprockets—Precision ground.

Lens—1½″ f/1.8 Projection (Wocoted).

Shutter—Spring steel. Flickerless at 2 and 16 frames per second.

Illumination—High intensity 250 Watt lamp. Direct optical system with coated condenser elements.

Cooling—Forced draft. Lamp cannot be switched on unless fan is working.

Heat Filter—Heat absorbing glass. Reduces screen illumination on still picture by only 12%.

Capacity—800 feet.

PHYSICAL CHARACTERISTICS

Size—13¼″ x 8¾″ x 6″.

Weight—13¼ lbs.

Shipping Weight—Approximately 26 pounds in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17″ x 13″ x 12″.

Projector Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH PROJECTOR

Compartmented Carrying Case.

10 foot Power Cord.

10 foot Remote Single Frame Control Cord.

400 foot Film Reel.

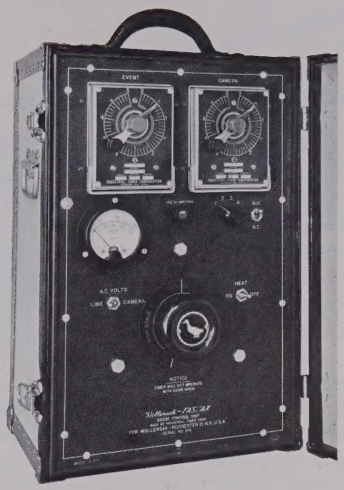
400 Foot Film Can.

Instruction Book.

PRINTED IN U.S.A.

WF-301, WF-358 Fastax Power Control Units

Goose Control Unit permits the synchronization of the camera with the event to be photographed, regulation of the camera speed, and remote control of camera and/or event. A four position selector switch controls camera and event start-stop cycle so that camera and event can be started together, or camera started before event by any predetermined time interval or, conversely, event started first with camera start following by any predetermined time interval. Event actuated through a selected open or closed relay. Camera speed controlled by variable AC auto transformer with maximum output of 280 volts. Camera control circuit also incorporates a 70 millisecond delay timer when operating above 130 volts.



WF-301 GOOSE CONTROL UNIT, 115 VOLT AC 60 CYCLE

Specifications:

Voltage Control—0-280 volts AC, 60 cycle.

Power Requirements—115 volts AC, 60 cycle, 30 amperes, with capacity to withstand 100 ampere momentary shock.

Timers—Two plug-in timers supplied, one for camera and one for event. For use with 100 foot capacity Fastax Cameras normally supplied with two 5 second timers—with 400 foot cameras, one 5 second and one 30 second timer. 15 second, 30 second, 60 second, and 5 minute timers available as accessories.

Control—Push-button or remote.

Connectors—Standard AN.

WF-358 GOOSE CONTROL UNIT, 115/220/240 VOLT AC 50 CYCLE

Specifications:

Voltage Control—0-280 volts AC, 50 cycles.

Power Requirements—115/220/240 volts AC, 50 cycle, 30 amperes, with capacity to withstand 100 amperes momentary shock.

Timers—Two plug-in timers supplied, one for camera and one for event. For use with 100 foot capacity Fastax Cameras normally supplied with two 5 second timers—with 400 foot cameras, one 5 second and one 30 second timer. 15 second, 30 second, 60 second and 5 minute timers available as accessories.

Control—Push-button or remote.

Connectors—Standard AN.

PHYSICAL CHARACTERISTICS

Size—10″ x 18″ x 10″.

Weight—60 lbs.

Shipping Weight—Approximately 85 lbs. in carrying case packed for domestic shipment.

Size of Shipping Carton—26″ x 17″ x 15″.

Color—Fastax gray with black control panel.

ADDITIONAL ITEMS FURNISHED

One Power Cord.

One Camera Cord.

One Event Cord.

One Timing Light Cord.

One Remote Control Cord.

One Instruction Book.

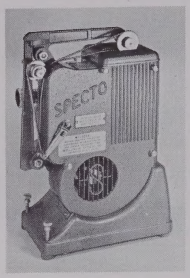
WF-329A, WF-329B Fastax Motion Analysis Projectors

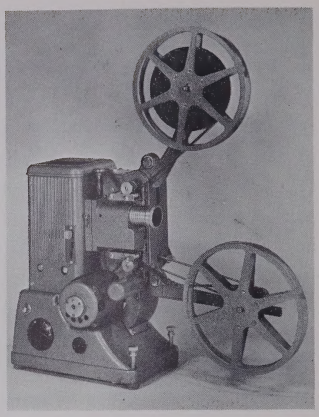
THE MOTION ANALYSIS PROJECTOR

The Wollensak Motion Analysis Projector is designed for the study and analysis of movement of subjects filmed by Fastax 8mm and 16mm high speed motion picture cameras. The films may be projected at the slow motion speed of 2 frames per second without flicker in addition to the normal projection speed of 16 frames per second. A still picture of indefinite duration may also be shown with a small amount of screen illumination loss.

The framing rate is controlled by a single lever which may be moved in either direction or from any one setting to another while the projector is running. The projector incorporates a special feature which allows the film to be advanced frame by frame at the screen. The single frame changing device will shift only one frame at each press of either the fixed or remote button irrespective of the period of pressure applied. Refocusing is not necessary when shifting to or from the hold frame position.

A built-in frame counter enables a single frame or sequence to be identified and correlated with time.





TECHNICAL SPECIFICATIONS

Models—WF-329A - 16mm Half Frame - Pull-down (for 8mm perforated film). WF-329B - 16mm Std. Full Frame Pull-down.

Framing—16pps, 2pps, frame by frame or still picture.

Body—Aluminum alloy casting.

Gears—All machine cut.

Motor—Universal 110 volt AC-DC. Electrically governed.

Gate—Film guide and pressure plate mirror polished stainless steel.

Sprockets—Precision ground.

Lens—1½" f/1.8 Projection (Wocoted).

Shutter—Spring steel. Flickerless at 2 and 16 frames per second.

Illumination—High intensity 250 Watt lamp. Direct optical system with coated condenser elements.

Cooling—Forced draft. Lamp cannot be switched on unless fan is working.

Heat Filter—Heat absorbing glass. Reduces screen illumination on still picture by only 12%.

Capacity—800 feet.

PHYSICAL CHARACTERISTICS

Size—13¼" x 8¾" x 6".

Weight—13¼ lbs.

Shipping Weight—Approximately 26 pounds in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17" x 13" x 12".

Projector Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH PROJECTOR

Compartmented Carrying Case.

10 foot Power Cord.

10 foot Remote Single Frame Control Cord.

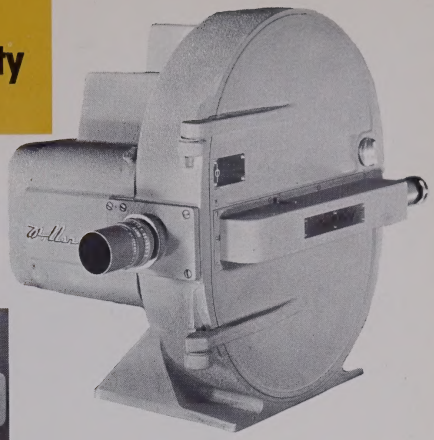
400 foot Film Reel.

400 Foot Film Can.

Instruction Book.

PRINTED IN U.S.A.

WF4S • 16mm Fastax Camera | 400′ capacity



TECHNICAL SPECIFICATIONS

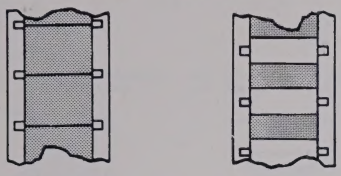
Film Capacity—400′ daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. ½ Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or
- 0.040″ x 0.410″ Slit
- 0.030″ x 0.410″ Slit
- 0.020″ x 0.410″ Slit
- 0.010″ x 0.410″ Slit
- 0.005″ x 0.410″ Slit
- 0.003″ x 0.410″ Slit

Speed—350 to 9000 P.P.S. (pictures per second).

Effective Shutter Speed—(SS)

With Standard, 16mm Aperture

$$SS = \frac{1}{3 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 8000 pps with Standard Aperture in place

$$SS = \frac{1}{24{,}000} \text{ of a second}$$

At 8000 pps with 0.003″ Slit in place

$$SS = \frac{1}{800{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet Mount.

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

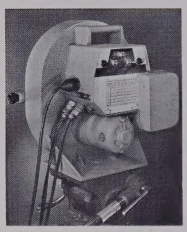
Timing Light—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time. Timing light exposes 120 "pips" or "marks", per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WF311 Timing Light Generator.* Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Stop-start Characteristic—Camera can be rapidly stopped at any point permitting multiple runs throughout 400 foot roll. Operable at any frame rate. Dynamic braking on drive motor — prism shaft assembly. Synchronized magnetic braking on feed spindle and take up motor.

Cut-off Switch—Automatically cuts off camera at the end of the film run.

**Available as an accessory.*



Power Requirements, Recommended—

Minimum - 16 volts DC, 2.4 Amps approx.
Maximum - 28 volts DC, 3 † Amps approx.
Minimum - 45 volts AC, 2.5 Amps approx.
Maximum - 280 volts AC, 16 Amps approx.

†DC voltage rating limited by the cut-off switch—If cut-off switch is disconnected, higher DC voltage can be used.

Connections—

Camera Power Input: 110V AC-DC Amphenol connector.
Braking Circuit Input: 2 prong Hubbell Twist Lock connector.
Remote Control: Amphenol connector.
Double Timing Light: Amphenol connector.

Switches—

Camera Power "On-off".
Stop-Start.
Speed Range Selector Switch.

Motors—Two motors (115-volt AC-DC 60 cycle). One for drive, one for take-up. Cover complete speed range.

Tripod Socket—Thread size, ⅜ x 16 N.C.

PHYSICAL CHARACTERISTICS

Size—14″ x 17″ x 13″.

Camera Weight—Approximately 85 pounds in carrying case packed in carton for domestic shipment. Size of Shipping Carton: 15″ x 19″ x 20″.

Export Weight—120 pounds.

Export Shipping Carton Size—17″ x 21″ x 22″.

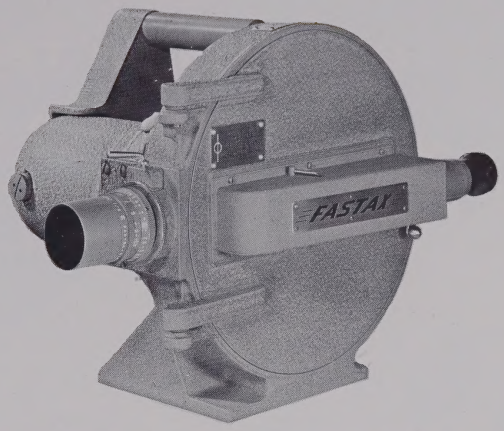
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Spool, for daylight loading. (5)
Instruction book.
Two dust caps.
Lubricant atomizer.
5/32″ Allen wrench.
9/16″ open-end wrench.
Warranty card.
Film-spool gage.
3 Amphenol connectors.

PRINTED IN U.S.A.

WF3T • 16mm Fastax Camera | 100′ capacity



TECHNICAL SPECIFICATIONS

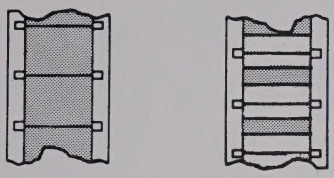
Film Capacity—100 daylight loading spool.

Film—16mm.

Frame Size—

With Standard 16mm Aperture Plate, 16mm Full Frame.

With Interchangeable Slit Apertures Approx. 1/3 Full Frame.



SLIP ONE OUT, SLIP THE OTHER IN

Aperture—

16mm Full Frame or

0.040″ x 0.410″ Slit
0.030″ x 0.410″ Slit
0.020″ x 0.410″ Slit
0.010″ x 0.410″ Slit
0.005″ x 0.410″ Slit
0.003″ x 0.410″ Slit

Speed—150 to 6000 P.P.S. (pictures per second).

Shutter—2 sided High Index Glass Rotating Prism.

Effective Shutter Speed—(SS)

With Standard 16mm

$$SS = \frac{1}{5 \text{ x pps}}$$

With 0.003″ Interchangeable Slit Aperture.

$$SS = \frac{1}{100 \text{ x pps}}$$

i.e.: At 6000 pps with Standard Aperture in place

$$SS = \frac{1}{30{,}000} \text{ of a second}$$

At 6000 pps with 0.003″ Slit in place

$$SS = \frac{1}{600{,}000} \text{ of a second}$$

Lens—2″ (50mm) *f*/2.0 Fastax Raptar in focusing mount.

Lens Mount—FX1 Fastax Bayonet Mount.

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

Timing Light—Single timing light—120 "pips" or "marks" per second when energized by 60-cycle current; 100 or 1000 marks per second when activated by WF-311 Timing Light Generator.*

Pips or marks exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cut-off Switch—Automatically cuts off power to camera at the end of the film run.

Power Requirements, Recommended—

Minimum - 9 volts DC, 2.4 Amps approx.
Maximum - 30 volts DC, 3.0 Amps approx.
Minimum - 25 volts AC, 2.5 Amps approx.
Minimum - 200 volts AC, 10 Amps approx.

Motors—Two motors (115 volts, AC-DC, 60 cycle). One for drive, one for take-up.

Tripod Socket—Thread Size, ⅜″ x 16NC.

PHYSICAL CHARACTERISTICS

Size—12″ x 12″ x 12″.
Camera Weight—25 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17″ x 16″ x 16″.
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartmented fiber carrying case with metal-reinforced corners.
Camera test film.
Camera focusing film.
Camera speed characteristic chart.
2-ounce bottle of camera lubricant.
20-foot power cord.
Plug for timing light.
Instruction book.
One dust cap.
Lubricant atomizer.
100′ film-spool, for daylight loading.
100′ film-spool can.
Warranty card.

*Available as an accessory.

PRINTED IN U.S.A.

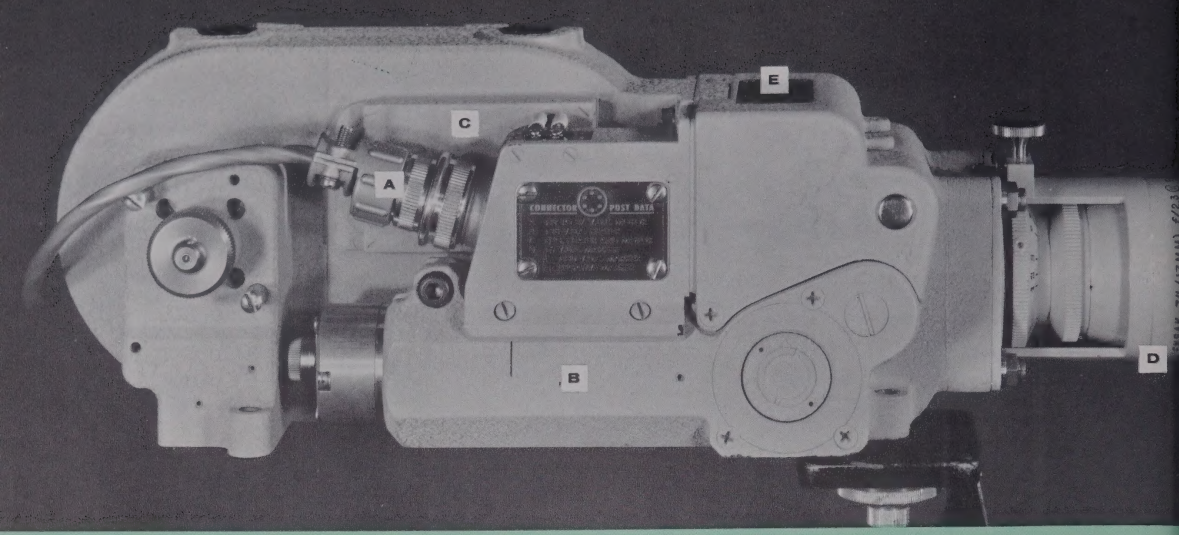
FASTAIR

THE WORLD'S FOREMOST HIGH SPEED 16mm MOTION PICTURE CAMERA

with **NEW** *Ball-Bearing Shutter Mounting*

by WOLLENSAK

- ✶ *Withstands Highest G Loads*
- ✶ *Daylight Loading Magazines*
- ✶ *Multiple Stop Start Operation*
- ✶ *Fastest Acceleration to Required PPS Rates*
- ✶ *Smallest and Lightest High Speed Camera Made*



A AN Connector Plug
B Interchangeable Motors
C Thermostatically Controlled Heater
D Interchangeable Lenses
E Chamber for Timing Light Marker Generator

FASTAIR ...Today's High Speed Came

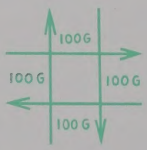
with *Tomorrow's Requirements*

The Wollensak FASTAIR, 16mm Camera, is the first high-speed motion picture camera specifically designed to record the flight characteristics of guided missiles . . . to augment ground tracking by photographing the ground or instruments on board the missile . . . to provide information for analysis on the response and accuracy of the sensing mechanisms.

The use of the FASTAIR camera is not restricted to missile studies, but can be used in other related fields, such as aircraft gunnery, gunnery training, study of mechanical linkage, flight characteristics, fluid flow, instrument readings, strain of aircraft and components either in wind tunnels or in actual flight.

The FASTAIR uses a rotating prism to secure high-speed picture taking rates not possible with intermittent film movement cameras. The unique design of the rotating prism in conjunction with the high quality FASTAIR-Pro-Raptar lenses produces the finest picture quality obtainable. A single battery-operated motor drives the few moving parts. Camera speed is dependent on D.C. voltage applied.

FASTAIR...
built to withstand highest G loads



Prior to the development of the FASTAIR, no high-speed camera could be used satisfactorily in missile photography due to the extremely high "G" or gravity load factor to which it was subjected during acceleration or deceleration of the carrier vehicle. In addition, no camera could withstand the severe vibrations often occurring in missiles just prior to component failures.

Finally, a missile camera had to be small . . . compact. solve these basic problems Wollensak engineers and signers incorporated features in the FASTAIR never bef used in a high-speed camera. The FASTAIR is made of stro rugged materials properly gusseted for maximum rigidi It is light and versatile . . . will operate at film speeds up to 6 pictures per second and may be started and stopped as quired.

The development of the FASTAIR camera is one of toda finest optical and mechanical achievements. Wollensak proud to be able to make this camera available to Government, the Armed Services and Industry in further America's development of guided missiles.

Only

FASTAI

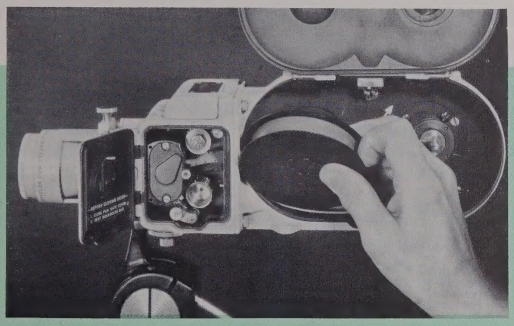
has all these featu

characteristics of the 16mm *FASTAIR:*

1. POWER REQUIREMENTS

Motor Type	Motor Symbol	Pictures per Sec.	Operating Volts D.C.	Approx. Ampere
Low Speed	L	12	12	0.7
		16	14	0.8
		24	20	0.9
		32	26	1.1
Medium Speed	M	100	14	2.5
		200	22	3.0
		300	30	3.5
High Speed	H	350	16	7.0
		400	16.5	7.5
		500	19	8.0
		600	23	8.2
		680	28	8.5

2. TIMING LIGHT MARKER • The Timing Light Marker is an NE 2a Neon Glow Lamp which exposes pips or marks on the film for reference. It can be activated by an exterior oscillator system such as the Wollensak Fastax WF 311 Pulse Generator or by a built-in timing marker generator furnished as an accessory when ordered. (See accessories)

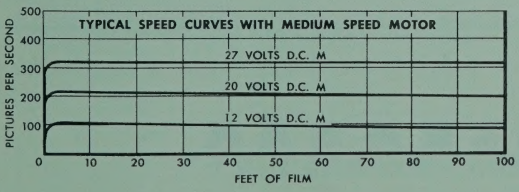


DAYLIGHT LOADING MAGAZINES • 50′ and 100′ Daylight Loading Magazines are available. They use film on Standard Daylight loading spools. The 200′ Darkroom Load Magazine is also available and uses 16mm film wound emulsion in, on the Eastman Kodak Type 1 or DuPont No. 32 plastic core.

G LOAD • Will withstand acceleration forces up to 100 G's in four principal mounting attitudes.

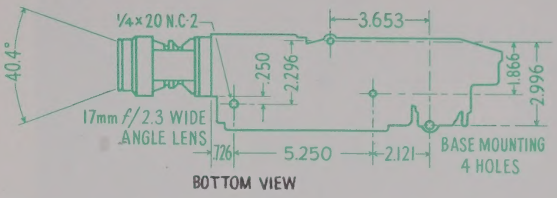
SPEED RANGES • Continuous rotating prism synchronized with film movement permits taking pictures from 12 to 600 per second.

Note on the speed characteristic curve that a FASTAIR camera reaches top speed almost instantaneously (in less than three feet of film) and maintains uniform speed through the entire footage.



3. G LOAD REQUIREMENT • Camera with lens will operate under acceleration or deceleration loads up to 100 G's.

4. CAMERA DIMENSION • Length (with 17mm lens and 100′ magazine) $13\frac{15}{64}$″. Height (with 100′ magazine) $4\frac{17}{32}$″. Width $3\frac{35}{64}$″.



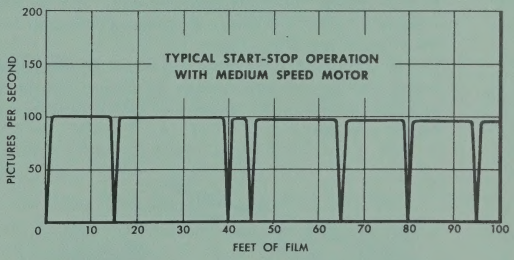
5. CONNECTORS • Type AN Connector Plug furnished.

6. CAMERA WEIGHT • With loaded 100′ magazine, approximately 8½ pounds.

7. FINISH • Light gray with fine wrinkle.

MULTIPLE RUN • Camera can be started or stopped any time during film run. (Not recommended at speeds above 400 PPS)

Note the minimum of film used to reach maximum speed even on intermittent runs.



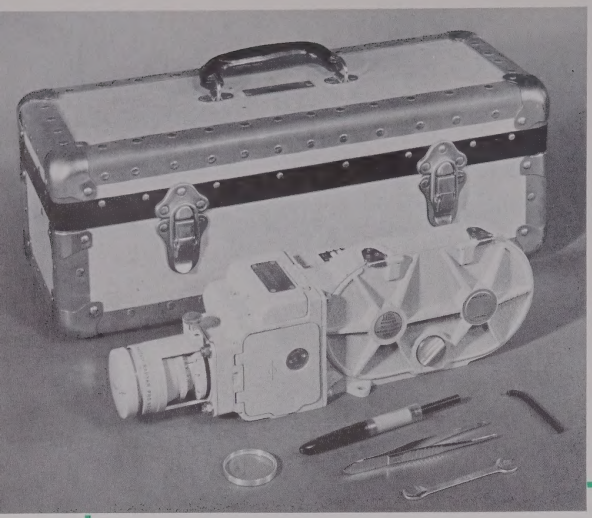
INTERCHANGEABLE MOTORS • Low, medium, or high-speed motor controls speed ranges.

Low speed motor . . . . . 12 to 32 pictures per second
Medium speed motor . . . . 100 to 300 pictures per second
High speed motor . . . . . 350 to 600 pictures per second

INTERCHANGEABLE LENSES • A complement of lenses are available in focal lengths from 5.3mm to 6″.

HEATER • A thermostatically controlled heater to be used when the camera is operated from 40° F. to −65° F. Two heaters are furnished—one in the camera body, one in each magazine.

DESIGN • Rugged, small, compact.



FASTAIR

...16mm High Speed Motion Picture Camera

The Standard FASTAIR 16mm Camera consists of 10 magazine, medium speed motor (100 to 300 PPS), and choice of either 17mm, ½", or 1" *f*/2.3 FASTAIR-Pro-Rapta lens in focusing mount with haze filter. Cameras are sup plied with gray fiber case, lubricant applicator, Alle wrench, loading tweezer and one package (12) spade lug

Accessories for FASTAIR ... The following line of accessories is available, thus enabling the FASTAIR to meet industrial and governmental requirements:

LENSES:

½" *f*/2.3 ... FASTAIR-Pro-Raptar Lens in focusing mount
17mm *f*/2.3 . FASTAIR-Pro-Raptar Lens in focusing mount
1" *f*/2.3 .... FASTAIR-Pro-Raptar Lens in focusing mount
2" *f*/2.3 .... FASTAIR-Pro-Raptar Lens in focusing mount
3" *f*/2.3 .... FASTAIR-Pro-Raptar Lens in focusing mount
4" *f*/2.3 .... FASTAIR-Pro-Raptar Lens in focusing mount
5.3mm (84°) *f*/1.5
FASTAIR-Raptar Lens in fixed focus mount
6" *f*/3.8 .... FASTAIR-Pro-Raptar Lens in focusing mount

BORESIGHT:

FASTAIR Finder Boresight (Straight axis) 10× to 20×. (Figure 1.) FASTAIR Finder Boresight (Periscope 360° Viewing) 10× to 20×. (Figure 2.)
The FASTAIR Finder Boresight is used for focusing, composing and boresighting through the camera lens. It can be easily fastened to the camera and used without removing the magazine.

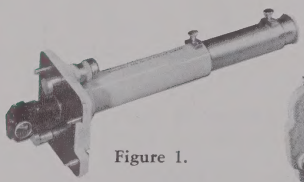


Figure 1.

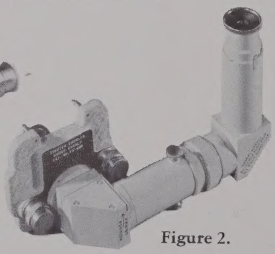


Figure 2.

TIMING LIGHT MARKER GENERATOR:

The generator is a miniaturized unit supplying 10 cycles per second pulse to the timing light. A 100 cycle per second unit can also be supplied on special order. These systems require a small power pack supplying 6 volts DC and 180 volts DC (Power pack not supplied with camera). When ordered the Wollensak FASTAIR generator is supplied as an integral part of the camera body.

MAGAZINES:

FASTAIR 50′ film capacity Daylight load
FASTAIR 100′ film capacity Daylight load
FASTAIR 200′ film capacity Darkroom load

MOTORS:

FASTAIR, low speed ..... 9v to 23v
FASTAIR, medium speed ..... 12v to 27v
FASTAIR, high speed ..... 16v to 28v

CUTOFF SWITCH:

A Cutoff Switch available for use with 50- and 100-ft.-capacity cameras terminates power when all film has run through camera. Limited to moderate G load applications. Installed on new cameras when ordered.

FOR THE FINEST IN PHOTOGRAPHY THE WORLD OVER · IT'S WOLLENSAK ·

WOLLENSAK
OPTICAL COMPANY • ROCHESTER 21, N. Y.

ntroducing the

WOLLENSAK TL35 TIME LAPSE CAMERA

A DATA RECORDING TIME LAPSE CAMERA

photograph panels, meters, gauges, instru-ents, mechanical devices, etc., for time study and quence analysis of movement. Each exposure made at a predetermined interval depending on the motor used.

A range of different speed motors is available select a specific time interval to meet a definite quirement. The motor used determines the ex-sure time interval. Exposure time lapse ranges m one picture every six seconds to one picture ery thirty minutes.

Lens — 35mm *f*/3.5 Wollensak Amaton

Shutter — No. 0 Alphax; shutter speeds 1/25, 1/50, 1/100, 1/150, and bulb. Sync. shutter (class M 1/25 - class F 1/100 and slower) available at an additional charge.

Focusing — Front crown focusing; 3′, 4′, 5′, 6′, 8′, 10′, 15′, 25′, 50′, inf.

Film — 35mm

Format — 15/16″ x 1″ (23.8mm x 25.4mm)

Capacity — 50′ daylight loading spools (2 spools furnished with camera)

Filter and Filter Adapting Ring — Series V (commercially available)

Motor — 6 volt D.C., 0.1 Amps

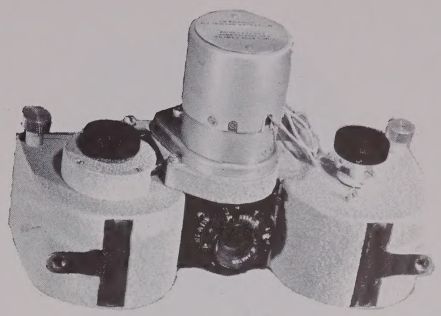
Film Travel — Operates continuously with power applied. Rate of time lapse is dependent upon choice of motor.

•

The following motors are available with cameras to obtain various time lapse intervals:

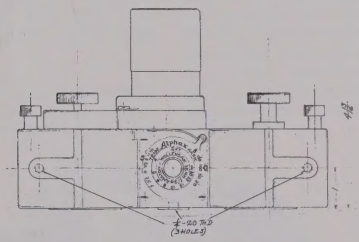
1 Picture every 6 seconds	1 Picture every 2½ minutes
1 Picture every 7½ seconds	1 Picture every 3 minutes
1 Picture every 15 seconds	1 Picture every 5 minutes
1 Picture every 30 seconds	1 Picture every 7½ minutes
1 Picture every 1 minute	1 Picture every 15 minutes
1 Picture every 1½ minutes	1 Picture every 22½ minutes
1 Picture every 2 minutes	1 Picture every 30 minutes

• *Other motors for longer intervals can be made available* •



PHYSICAL CHARACTERISTICS

Length	6½″
Height	4-13/16″
Width	2-27/32″
Tripod or Mounting Holes	3 Holes ¼″, 20 Thd
Weight	2½ lbs.



GENERAL

The Wollensak TL35 Time Lapse Camera was specifically designed to meet a customers definite requirement. Other features and accessories such as a finder, terminal block, footage counter, etc., can be supplied. The film format for this camera (23.8mm x 25mm) is larger in comparison to the standard 35mm format (18mm x 24mm).

The Standard Wollensak TL35 Time Lapse Camera will satisfy many data recording interval exposure needs. Multiple camera installations can be made where photographs of 2 or more events are required at the same approximate time.

Inquiries for modified cameras to meet other requirements are invited.

WOLLENSAK
OPTICAL CO., ROCHESTER 21, N. Y.

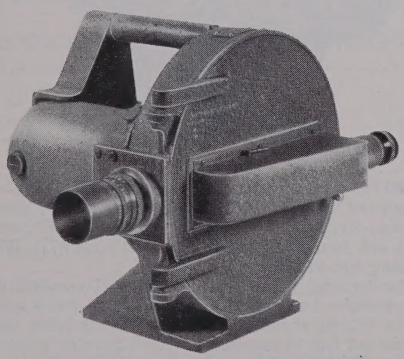
FASTAX HIGH-SPEED MOTION PICTURE SYSTEM

Wherever high speed object motion must be viewed for making accurate, thorough analyses, the Fastax system of high-speed motion picture photography will do the job. It is invaluable for studying the action of high-speed machinery, checking manufacturing processes, recording electronic data from oscilloscopes, study of chemical reactions and numberless other uses in the industrial, scientific, and general research fields.

Fastax cameras are available in models for 8, 16, or 35mm film. Films taken with Fastax cameras can be shown on standard projectors (modified projectors available for special applications). Besides the various camera models, the Fastax system includes lenses, lighting equipment, control units, film, etc.

cameras

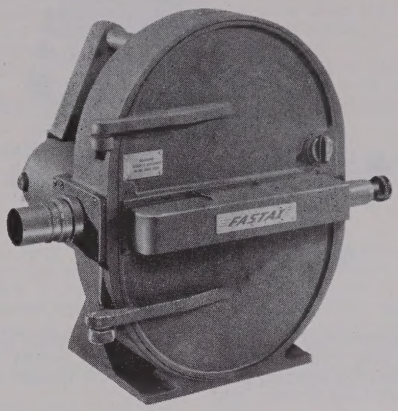
Fastax cameras are electric motor-driven (110 volt AC-DC), precision-made units employing the rotating prism principle utilizing continuously moving film. Without auxiliary equipment, when operating on a 120 volt AC, these cameras will deliver 10,000, 5,000, or 3,500 pictures per second, depending upon whether an 8, 16, or 35mm model is used. Increasing or decreasing operating voltage increases or decreases picture-taking rate. To operate the cameras at the highest picture-taking rates it is necessary to use special auxiliary equipment such as the WF-358 "Goose" Control Unit. For speeds of less than 1000 pictures per second direct current is recommended. Storage batteries (wet cell or "hot-shot" type) or rectified AC utilizing the WF300 rectifier and a WF-314 Powerstat, can be used.



MODEL WF1 is an 8mm camera providing time-magnifications up to 1000 times; taking rate 300 to 16,000 pictures per second. Furnished with two types of aperture masks for use with standard or double width 8mm film. (Latter provides field width of 16mm film, but with 8mm height; useful in measuring subjects with fairly high rates of linear velocity) 100-ft. film capacity; uses daylight-loading spools. Has integral viewfinder for true field size. Single neon timing light (double timing light can be furnished on special order) automatic cut-off switch, size 12x12x12"; weight 25 lbs., furnished with Raptar 50mm f/2 lens and the following auxiliary equipment; carrying case, atomizer, 2-oz. bottle of camera oil, 20-ft. camera cord, plug for timing light test film and speed characteristic chart, **$1795**

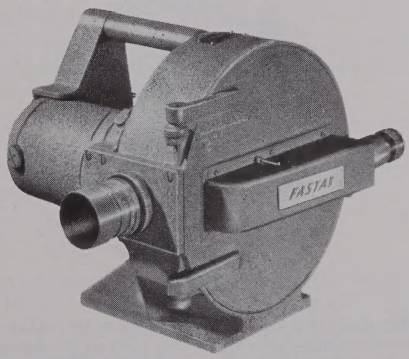
MODEL WF3 is a 16mm camera providing time magnifications from 9 to 500 times. Excellent for all-around industrial work. 100-ft. film capacity; picture taking rate 150 to 8,000. All other specifications and auxiliary equipment same as Model WF1, except WF314 Powerstat also included, **$1795**

MODEL WF2 is similar to WF1, but has 400-ft. film capacity; picture taking rate, 700 to 18,000. Weight 38 lbs., size 14x17x13". Complete with double timing light. Comes with same auxiliary equipment as WF1, **$3000**



MODEL WF4 is similar to WF3, but has 400-ft. film capacity; picture taking rate, 350 to 9000. Weight 38 lbs., size 14x17x13". With same auxiliary equipment as WF1, **$3000**

MODEL WF5 is a half-frame height 35mm camera. Valuable for studying long "pencil shaped" objects such as rockets, jet flames, ballistics, etc.; picture taking rate 100 to 6000. 100-ft. film capacity, uses Daylight Loading spools. Furnished with detachable reflex viewfinder for composition and integral viewfinder for critical focus. Equipped with 35mm, f/2 lens. (All other specifications and auxiliary equipment same as Model WF1), **$2850**



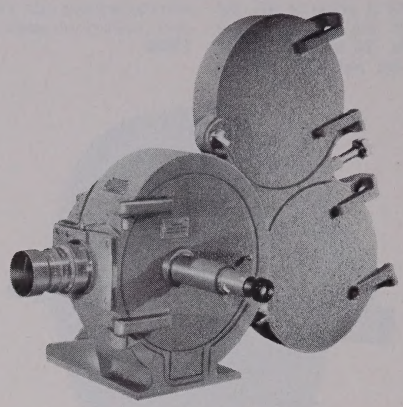
MODEL WF6 is similar in design to the WF-3 camera except rotating prism is not supplied. Speed range 4 to 200 ft. per second; primarily intended for oscilloscope recordings, determining rates of detonation or study of flame propagation. With same auxiliary equipment as Model WF1, **$1450**

MODEL WF7 is similar in design to the WF5 camera except rotating prism is not supplied; speed range 3 to 190 ft. per second; primarily intended for oscilloscope recordings, determining rates of detonation or study of flame propagation. All other specifications and auxiliary equipment same as Model WF5, **$2350**

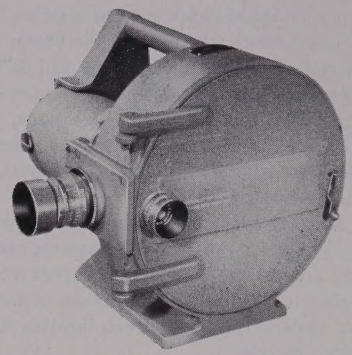
MODEL WF8 is a full frame 35mm camera supplied with 500 ft. daylight loading spools. 800-ft. spools available on special order. Picture taking rate 200 to 2500 pictures per

continued on next page

FASTAX HIGH-SPEED MOTION PICTURE SYSTEM

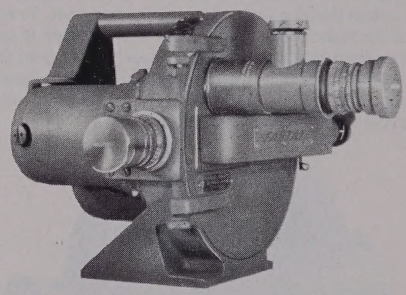


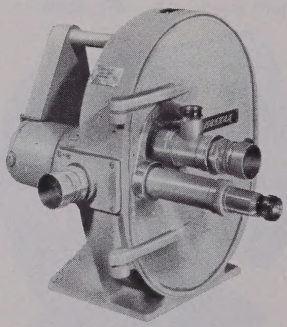
second. Features double-timing light, removable reflex telescopic viewfinder for composition and focusing, and 101mm f/2.3 Fastax Pro-Raptar lens. Size 17x22x26", weighs 62 lbs., carrying case and auxiliary equipment similar to that furnished with WF1, **$6500**



MODEL WF9 is a combination 35mm half frame high-speed motion picture and oscillographic recording camera primarily intended for recording electronic data simultaneously with picture. (Half the frame records oscillographic streak while other half registers pictures.) Taking rate 100 to 6,000 pictures per second, or 3 ft.-190 ft./sec. 100-ft. film capacity. Features Type II removable reflex finder, daylight loading spools and two 35mm f/2.0 Raptar lens in focusing mount. Other specifications and auxiliary equipment same as Model WF1, **$3000**

MODEL WF14 is a 16mm, 400-ft. capacity combined motion-picture and superimposed oscillographic camera; size 14x17x13", weight 38 lbs; furnished with 50mm f/2.0 Raptar picture-taking lens and 35mm f/2.0 Raptar Oscillographic taking lens. Removable finder and removable reflex finder, Type III, are also furnished. Equipped with double-timing light and automatic cut-off switch. Picture-taking rate 650 to 8,000 (16 to 200 ft. per second). Same auxiliary equipment as Model WF1, **$3750**





MODEL WF15 is an 8mm, 400-ft. capacity combined motion-picture and superimposed oscillographic camera. Picture-taking rate 1,300 to 16,000 (16 to 200 ft./sec.). All other specifications and auxiliary equipment same as Model WF14, **$3750**

MODEL WF17 is a 16mm, 100-ft. capacity combined motion-picture and superimposed oscillographic camera. Furnished with 50mm f/2.0 Raptar picture-taking lens and 50mm f/2.0 Raptar Oscillographic taking lens. Integral viewfinder for composition and critical focusing of motion picture subject and Type III removable Reflex finder for composition and focusing of oscillographic trace. Equipped with single timing light and automatic cut-off switch. Picture-taking rate 150 to 8,000 (5 to 200 ft. per second). Other specifications and auxiliary equipment same as WF1, **$2250.** Existing WF3 camera may be modified to the WF17, **$575**

MODEL WF21 is similar to Model WF17 above except that it accommodates 8mm film, has 100-ft. capacity. Provides picture-taking rate from 300 to 16,000 frames per second (5 to 200 ft. per second). Other specifications and auxiliary equipment same as WF1, **$2250.** Existing WF1 cameras may be modified to WF21, **$575**

lenses

Lenses for the Fastax are interchangeable with all models except WF8, (Special lenses for WF8 available) and come in a wide range of focal lengths and speeds. All lenses in the following listing are in focus-mount, unless otherwise noted (lenses can be supplied with distance-scale in meters, if desired)

FASTAX RAPTARS:—In Foc. Mt.

WF100A, 25.4 mm f/2.3	**$195**
WF102, 35mm f/2	**$185**
WF105, 50mm f/2	**$195**
WF106, 50mm f/2.7	**$185**
WF107, 63mm f/2.7	**$165**
WF108, 75mm f/2.5	**$165**
WF110, 101mm f/3.5	**$165**
WF111, 152mm f/4.5	**$165**
WF113, 254mm f/4.5	**$265**
WF115, 381mm f/5.6 (f.f.)	**$300**

WIDE ANGLE:

WF121, 3.2mm (142°) f/1.5—**$694.40**
WF122, 5.3mm (84°) f/1.5 — **$215**
WF142, 13mm f/1.6 **$215**
WF142, 13mm (56°) f/1.8 — **$215**
Above are fixed focus.

LENS KIT: Includes 35mm f/2, 101mm f/3.5, 152mm f/4.5 lenses, plus ⅜, ⅝, 1 and 2" extension tubes with case. WF126, **$526.50;** WF127, same as above, with 50mm instead of 35mm lens, **$535.50**

SPECIAL LENSES FOR MODEL WF8 CAMERA: In focusing mounts; Fastax Pro Raptar WF201, 101mm f/2.3, **$297.50;** WF202, 152mm f/2.7, **$325;** WF203, 75mm f/2.3, **$257.50;** WF204, 25mm f/2.3, **$242;** WF205, 35mm f/2.3, **$232.50;** WF206, 50mm f/2.3, **$237.50**

FASTAX HIGH-SPEED MOTION PICTURE SYSTEM

auxiliary optical equipment

FIDUCIAL MARKING ATTACHMENT adds fiducial marker to the image, eliminating the need for reference lines at subject. WF136, for WF1 to WF7, WF9, WF14 and WF15 cameras, accepts any Fastax Raptar lens from 1" to 15", **$250.** WF209, for WF8 camera only, **$400**

EXTENSION TUBES for close-up work can be used singly or in combination, for all cameras except WF8: WF129, ⅜", **$17.50;** WF130, ⅝", **$17.50;** WF131, 1", **$17.50;** WF132, 2", **$17.50;** WF133, ⅛", Special lens shim, **$15.00;** WF134, ¼", **$17.50**

40-POWER MAGNIFYING MICROSCOPE EYEPIECE: provides critical focusing with Fastax telescopic viewfinders. WF135, **$135**

film

A variety of films are available for the Fastax camera. Wollensak 931 & Superior 4 negative films have been found to be especially suitable for High-Speed work. Fastax 931 can be used as either a negative or reversal film, a fine-grain, fast panchromatic emulsion that can stand processing temperatures up to 150° F., and has an ASA index of 160 daylight, 125 Tungsten with reversal processing. WF401, 8mm x 100′, **$4.95;** WF402, 16mm x 100′, **$4.95;** WF404, 16mm x 400′, **$16;** WF408, 35mm x 100′, **$9;** WF405, 8mm x 400′, **$16;** WF406-1, 35mm x 500′, **$40;** WF406, 35mm x 1000′, **$80.** Superior 4 Negative is an ultra high-speed, fine-grain emulsion designed for processing to a negative only, and has an ASA index of about 320 Daylight, 250 Tungsten. WF-411, 8mm x 100′, **$3.95;** WF412, 16mm x 100′, **$3.95;** WF414, 16mm x 400′, **$11.90;** WF415, 8mm x 400′, **$11.90;** WF418, 35mm x 100′, **$7.45;** WF416-1, 35mm x 500′, **$29.50;** WF416, 35mm x 1000′, **$58**

tripod

Allows 190° vertical, 360° horizontal swing. WF326, for smaller Fastax cameras, **$360;** WF326A, heavy duty, **$780**

timing light generator

Provides the time pip to the camera's neon lamp which marks the film at a pre-determined rate to establish time correlation, incorporates 100 and 1,000 cycle crystal control oscillator; 110-120 volts, 60 cycle, WF311, **$550**

control unit

In most cases synchronization between the camera and the event being studied is necessary. Also, since the picture taking rate is determined by the input voltage a camera speed control is necessary. **THE "GOOSE" CONTROL UNIT** incorporates both a variable AC voltage control and a set of timers for controlling relationship between event and camera. (one for controlling event; other for controlling camera). Switch selector permits starting camera before, with, or after start of event. Unit has voltmeter for checking output and line voltage equipped with remote control switch, standard AN connectors, two plug-in 5-second timers, (others available) 0 to 280-volt output, size 12x18x10"; weight 60 lbs., requires 30-ampere line, but will withstand 100-ampere momentary shock. WF-301 Goose Control Unit, 115-volt, 60 cycle, **$660.** WF-358 Goose Control Unit, 115-220 volt, 50 cycle, **$689.50**

FASTAX RECTIFIER for Fastax cameras. Used to convert AC to DC for low speed camera operation. WF300, **$125**

lighting

High-speed photography requires considerable illumination. In sunlight, adequate exposure is no problem (high-speed motion pictures of shells in flight have been taken at 5,000 per second). For indoor work, special Fastax equipment is available for providing maximum light on the subject.

WF-360 HIGH INTENSITY XENON LAMP consists of a control unit, a lamp housing containing a focusable paraboloid reflector, the Xenon lamp, connection cables, and an extending

continued on next page

SPECIFICATIONS OF FASTAX CAMERAS

Wollensak Camera No.	Film Capacity	Taking Rates Pictures Per Sec.	Aperture	Film Spool
WF1	8mm x 100′	300-16,000	8mm or dbl. width 8mm	DL*
WF2	8mm x 400′	700-18,000	8mm or dbl. width 8mm	DL
WF3	16mm x 100′	150-8,000	Normal 16	DL
WF4	16mm x 400′	350-9,000	Normal 16	DL
WF5	35mm x 100′	100-6,000	½ 35mm height	DL
WF6	16mm x 100′	4 to 200**	Oscilloscope or Streak	DL
WF7	35mm x 100′	3 to 190**	Oscilloscope or Streak	DL
WF8	35mm x 500′ ‡	250-2,500	Full 35mm	DL
WF9	35mm x 100′	100-6,000	½ Streak ½ Picture	DL
WF14xxx	16mm x 400′	650-8,000	16mm	DL
WF15xxx	8mm x 400′	1,300-16,000	8mm or dbl. width 8mm	DL
WF17xxx	16mm x 100′	150-8,000	16mm	DL
WF21xxx	8mm x 100′	300-16,000	8mm or dbl. width 8mm	DL

*DL — Daylight Loading Spools
** — Feet per second
‡ — 800′ Spools on Special Order
xxx — Combined Motion Pictures & Superimposed Oscillographic.

WOLLENSAK ANNOUNCES

The WF-4S Camera — Similar to the WF-4 but with electromagnetic and dynamic braking for multiple stop and restart operation throughout its rated speed range.

The "T" Series Cameras — The following models of Fastax Cameras can be supplied with a "Two" Sided Prism instead of the presently employed four sided prism:

WF-3T	WF-14T
WF-4T	WF-17T

Advantages of the two sided prism are: higher effective shutter speed, better overall frame coverage, and better resolution. Speed range, 150-6000 pictures per second.

Slit Aperture Housing and Masks — All current 8mm and 16mm Fastax Cameras come equipped with a slit aperture housing. This allows the use of slit masks. These slit masks make possible increasing the effective shutter speed or action stopping ability without increasing the frame rate.

For further information on the above or modernization of older cameras, contact Wollensak Optical Company, Rochester, N. Y., or see us.

FASTAIR—DATA RECORDING—MOTION ANALYSIS

telescopic stand with casters. The quartz lamp emits a 5mm point source light, has a color temperature of 5700°/K. The life of the lamp is virtually limitless. The control unit houses a voltmeter, ammeter and power control switch, with the latter allowing the lamp to be burned at 2½ KW, 5 KW, and 7½ KW. The equipment is designed to operate from a battery supply of 36 to 48 volts. Batteries are not supplied. Using high speed pan film (ASA160) perfectly exposed negatives have been obtained for medium toned subject 12″ wide. A WF-1 Fastax camera operating at 16,000 pictures per second, with an f/ stop of 8, using daylight color film (ASA10), an aperture of f/2.7 was used to record a medium toned subject 6 inches in diameter at a speed of 16,000 pictures per second. WF-360 Xenon Lamp, **$1795**

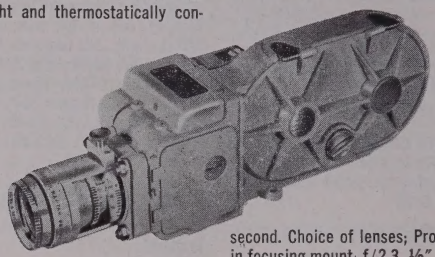
WF-322 FASTLITE is a high-intensity 1000-watt spotlight incorporating a parabolic mirror in back of a 100-volt lamp. The lamp may be focused. Water cells prevent excessive heat on the subject. At approximate 18″ intensities up to 150,000 foot candles can be obtained. The lamps are used in pairs and are burned at 120 volts. A series-parallel switch WF315A is available for focusing at half-voltage. With four Fastlites at 8 feet from the subject, it is possible to get 500 pictures per second at f/4.5, using ASA16 color film. At closer distances, up to 7,000 pictures per second can be made in color. WF322, per pair, **$495.** WF315A, Hi-Lo switch, **$42.50**

LIGHTING ACCESSORIES: WF321, Alligator clamp with porcelain socket and heavy-duty cord, **$8;** WF323, 750R reflector-spot lamp for portable work **$5.50**

FASTAX EXPOSURE METER is incident-type instrument for measuring high intensity light. Measures 0-3, 000, 0-30,000, and 0-300,000 foot candles. WF327, **$190**

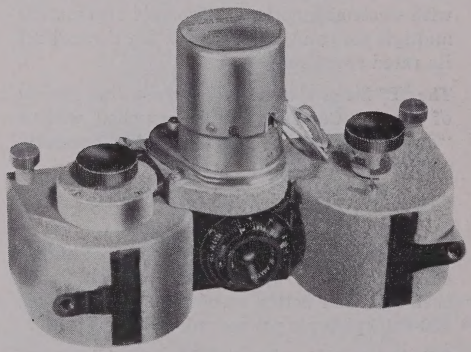
FASTAIR FINDER BORESIGHT is used for focusing and composing through the camera lens. It can be easily fastened to the camera and used without removing magazine. FA-66 (Straight axis) 10X to 20X. **$165** FA-662 (Periscope 360° viewing) 10 to 20X **$350**

WOLLENSAK FASTAIR CAMERA is a DC electric motor driven precision made unit employing the rotating prism principle utilizing continuously moving film, producing excellent picture quality. The speed range is variable from 12 to 600 pictures per second by interchangeable motors. Camera furnished with 2A Neon Timing Light and thermostatically con-



trolled heaters. Desired speed is reached very quickly and remains uniform throughout the film run. Can also be stopped and started. Camera with lens will operate under accele ation and deceleration to 100 G's. D load, magazines 50 and 100 foot ca pacity, also 200 foot dark room loa ing available. Motors: Low speed 1 to 32 pictures per second: Mediu speed, 100-300 pictures per second High speed 350-600 pictures pe second. Choice of lenses; Pro-Rapta in focusing mount f/2.3, ½″, 17mm 1″ or 5.3 (84°) f/1.5 Raptar in fixe focus mount. Model 100-MD, **$1295** Accessory lenses: 2″, **$235;** 3″, **$235** 4″, **$275;** 6″ f/3.8, **$295**

WOLLENSAK TL-35 DATA RECORDING CAMERA designed to photograph instrument panels, mechanical devices, etc., for time and sequence analysis of movement. Each exposure is made at a predetermined interval depending upon motor used. Exposure time lapse ranges from one picture every 30 minutes. Lens—35mm f/3.5 Wollensak Amaton; Shutter #0 Alphax; speeds 1/25 to 1/150 and bulb. Sync. Shutter, class M; Class F, 1/100 and slower available. Front crown focusing, 3 feet to infinity. 50 foot capacity DL Loading Spools. 35mm Film. Picture Format 15/16″ x 1″ (23.8mm x 25.4mm). Accepts Series 5 Filters. 6 Volt DC motor. Size 6½″ x 4-13/16″ x 2-27/32″. Weight 2½ lbs. **$350**



STANDARD FASTAIR 16MM CAMERA consists of 100-ft. magazine, medium speed motor, (100-300 pictures per second), choice of either ½″, 17mm or 1″ f/2.3 Fastair Pro-Raptar Lens, with haze filter, gray fiber case, lubricant applicator, Allen wrench, and one package (12) spade lugs. FA-16 Model 100 MD, **$1295**

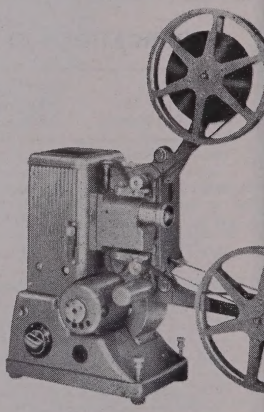
TIMING LIGHT MARKER GENERATOR is a miniaturized unit supplying a fixed frequency of 10 or 100 pulses per second. These generators require a small power pack supplying 6 and 180 volts DC respectively. (Power pack not supplied by Wollensak). When ordered, generator is supplied as integral part of camera body. FA-670, 10 cycle marker generator, **$100.** FA-671, 100 cycle, marker generator, **$100**

THE MOTION ANALYSIS PROJECTOR is designed for the study and analysis of movement of subjects filmed by 8 and 16mm high speed motion picture cameras. The films may be projected at the slow motion speed of 2 frames per second without flicker in addition to the normal projection speed of 16 frames per second. A still picture of indefinite duration may also be shown with a small amount of screen illumination loss.

The framing rate is controlled by a single lever which may be moved in either direction or from any one setting to another while the projector is running. The projector incorporates a special feature which allows the film to be advanced frame by frame at the projector or remotely at the screen. The frame by frame changing device will only shift one frame at each press of either the fixed or remote button irrespective of the period of pressure applied.

A built-in frame counter enables a single frame or sequence to be identified. This also permits the duration of an operation to be determined.

Framing — 16pps, 2pps, frame by frame and still picture. **Motor** — Universal 110 volt AC-DC electrically governed. **Lens** — 1½″ f/1.8 projec-



tion (Wocoted). **Illumination** — Hig intensity 250 watt lamp. Direct opt cal system with coated condense elements. **Cooling** — Forced draf Lamp cannot be switched on unles fan is working. **Heat Filter** — Hea absorbing glass. Reduces screen i lumination on still picture by onl 12%. **Capacity** — 800 feet. **Weight** 13¼ lbs. **Size** — 13¼″ x 8¾″ x 6 **Models** — WF-329A — 16mm Ha Frame, Pull-down (for 8mm perf rated film). WF-329B — 16mm St Full Frame Pull-down. WF-329A, **$55** each; WF-329B, **$510** each.

WOLLENSAK

Presents

A New Light Source For

HIGH-SPEED CINEMATOGRAPHY

THE WF-360
HIGH-INTENSITY XENON LAMP

with these Features

- COLD LIGHT
- BATTERY OPERATED
- POINT SOURCE ILLUMINATION
- EXTREME HIGH-LEVEL ILLUMINATION
- PERFECT COLOR BALANCE WITH DAYLIGHT COLOR FILM
- COLOR FILM (ASA 10) CAN BE USED AT 16,000 P.P.S.

General Information

High Speed Cameras generally require a very high level of subject illumination. The us of color film in high framing rate cameras has further increased the level of illuminatio required. Tungsten lamps have usually been used for this purpose but their comparativ inefficiency in lumens per watt, their large size, and their heavy power requirement o high illumination levels coupled with their high output of infra-red emission, introduce many problems in their use. Compact Source Mercury-Cadmium Arc devices have ove come some of these difficulties, but as a DC power supply with a voltage of at least 20 volts is required, it is often necessary to use a heavy and bulky, three-phase rectifier fo power. A further disadvantage exists in that this light source does not produce a contin uous spectrum and also the lamp requires a 10-minute warm-up period at approximatel 30 amps before it is ready for use.

WF-360 XENON LAMP

The Compact Source Xenon Light System consists of a control unit, a lamp housing con taining a focusable paraboloid reflector, the Xenon Lamp, connection cables, and a extending telescopic stand with casters.

LAMP

The lamp bulb is quartz. The source size is approximately 5mm in diameter having a colo temperature of 5,700°K. Because of the small illumination source, the lamp lends itsel well to Schlieren and shadowgraph photography. Furthermore, the compact source also permits the lamp to be used with projector optics of long focus where it is necessary to keep the light source a safe distance from the subject. Its life is virtually limitless; a lamp pulsed 10,000 times shows no serious fall-off in efficiency.

LAMP HOUSING

The reflector has a highly efficient aluminum mirror finish. A diffusing glass is attached to the front of the lamp housing to filter out the ultra-violet rays and to even out the pola distribution. The focus is such that at 3 feet a disc 5 inches in diameter is illuminated in the "full spot" position. In the "full flood" position a disc of relatively even illuminatior extends to 14 inches in diameter. A focus screw with locking nut is at the rear of the lamp housing and a hinged door on its underside provides access to the electrical connections

CONTROL UNIT

The control unit is cased in a portable console. Its cover is easily removable to allow extra cooling when using the unit for abnormally prolonged periods. This unit houses the voltage striking circuit making use of a 25 KV repeating pulse at a current flow of 25 amps. The lamp simmers at 700 Watts and pulsing power is selected on the panel. Each power setting also selects a period-limiting circuit so that at 2½ KW the pulse is of 10 seconds duration; at 5 KW it is 5 seconds; and at 7½ KW, 2 seconds. An overriding safety circuit prevents repulsing at shorter intervals than once every 30 seconds. A pulse can be originated by pressing a button on the control unit or by a contact being made to the "remote socket" on the panel. An additional receptacle on this panel provides a closed circuit during the period of operation for synchronization to auxiliary equipment.

A volt meter and an ammeter indicate the power being dissipated in the lamp during operation.

POWER SUPPLY

The equipment is designed to operate from a battery supply of 36 to 42 volts. Batteries are not supplied.

USE

Using high speed panchromatic film (A.S.A. 160) perfectly exposed negatives have been obtained of a medium toned subject 12 inches wide with a WF 1 Fastax Camera operating at 16,000 pictures per second, and with the lens stopped down to f/8. Using daylight color film (A.S.A. 10) an aperture of f/2.7 was used to record a medium toned subject 6 inches in diameter at a speed of 16,000 pictures per second. In both cases the lamp was used in the "full spot" position. Still another subject covering an area 14" x 20" was recorded on daylight color film at 2600 pps, aperture f/6.3. with the lamp 9 feet away at semi-full flood.

The amount of heat from the lamp is such that no discomfort is felt on the face if the lamp is brought to a maximum spot at a distance of 3 feet and pulsed at 7½ KW.

The exposure table on the following page suggests exposure settings for three types of emulsion over a speed range of 1,000 to 16,000 pictures per second. The f/ values given have been worked out for use with Fastax High Speed Cameras.

EXPOSURE TABLE

Lamp at Full Spot position with medium diffusing screen, illuminating a medium toned subject 6" in diameter.

Pictures Per Sec.	*A.S.A. 10*	*A.S.A. 80*	*A.S.A. 160*
2.5 KW Setting -			
1,000	f/6.3	f/16/22	f/22/32
2,000	f/4.5	f/11/16	f/16/22
4,000	f/3.2	f/ 8/11	f/11/16
8,000	f/2.2	f/5.6/8	f/ 8/11
16,000	—	f/4.5/5.6	f/5.6/8
5.0 KW Setting -			
1,000	f/9	f/22/32	f/32/45
2,000	f/6.3	f/16/22	f/22/32
4,000	f/4.5	f/11/16	f/16/22
8,000	f/3.2	f/ 8/11	f/11/16
16,000	f/2	f/5.6/8	f /8/11
7.5 KW Setting -			
1,000	f/11	f/32/45	—
2,000	f/8	f/22/32	f/32/45
4,000	f/5.6	f/16/22	f/22/32
8,000	f/4.0	f/11/16	f/16/22
16,000	f/2.7	f/ 8/11	f/11/16

MANUFACTURED BY: Mole-Richardson, England

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